

# *Schütziana*

The Gymnocalycium Online Journal



Volume 9, Issue 2, 2018  
ISSN 2191-3099

This document was published in pdf format: August 1<sup>st</sup>, 2018

## Content

Schädlich, Volker	<b>Editorial</b>	page 2
Schädlich, Volker Bercht, Ludwig Melojer, Michael	<b>A sensational discovery from the utmost northwest of Paraguay – <i>Gymnocalycium cabreraense</i> spec. nov.</b>	page 3-16
Meregalli, Massimo Papsch, Wolfgang	<b><i>Gymnocalycium leptanthum</i> and <i>Gymnocalycium parvulum</i></b>	page 17-25

**Published: August 1<sup>st</sup>, 2018**

### Legal notice

Publisher: WORKING GROUP SCHÜTZIANA, Fichtenweg 43, 14547 Fichtenwalde, Germany

Editorial team and responsible for the content: [www.schuetziana.org/contact.php](http://www.schuetziana.org/contact.php)

Mario Wick, 14547 Fichtenwalde, Fichtenweg 43, Germany, [mario.wick@schuetziana.org](mailto:mario.wick@schuetziana.org)

Wolfgang Papsch, 8401 Kalsdorf, Ziehrenweg 6, Austria, [wolfgang.papsch@schuetziana.org](mailto:wolfgang.papsch@schuetziana.org)

SCHÜTZIANA is the journal of the WORKING GROUP SCHÜTZIANA.

Source of supply: SCHÜTZIANA is available only as a pdf-file via World Wide Web and can be downloaded from:

[www.schuetziana.org/download.php](http://www.schuetziana.org/download.php).

The content of the respective article expresses the opinion of the author and not necessarily that of the WORKING GROUP SCHÜTZIANA.

The issues of SCHÜTZIANA are free of charge and may be distributed freely. The content and the pictures of the articles of SCHÜTZIANA are property of the author and may not be used for other purposes than reading, printing and storing without permission.

© 2018 WORKING GROUP SCHÜTZIANA. All rights reserved.

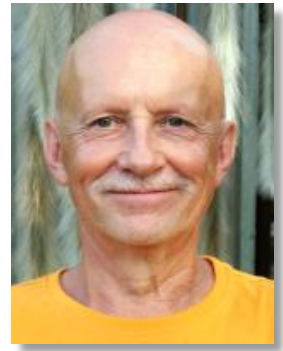
ISSN 2191–3099

**Cover page: *Gymnocalycium cabreraense* VoS 2122, Cerro Cabrera, Paraguay, photo: Volker Schädlich**

## Editorial

### Dear *Gymnocalycium* enthusiast!

Volker Schädlich



Spring 2018 began in winter and ended in summer. At the beginning of March, there was still severe frost in eastern Germany. But spring quickly followed. At the end of May, we already experienced the first heat wave of the year. The hottest April since the beginning of official temperature measurements was followed by an equally warm May. In the greenhouse, the cacti gave us a true flower festival. Almost South American conditions.

In recent years, new species from the genus *Gymnocalycium* have been described, especially from Argentina. Due to the relatively good infrastructure and the high plant density, a lot of cactus lovers are drawn to this country. In contrast, habitats in Paraguay are visited by relatively few *Gymnocalycium* friends. The reasons for this are the distance between locations, still very bad roads and countless annoying insects - especially in the Chaco.

Today's issue takes us to a very dry and hot area in the extreme northwest of Paraguay. Please, read the first description of *Gymnocalycium cabreraense* spec. nov. If you would like to know more about *G. cabreraense*, then simply come to our *Gymnocalycium* meeting in Radebeul near Dresden (Germany) from August 31 to September 2. There you will find more information about the new species, but also about other cacti and travel reports. You can find the programme on our website <https://www.schuetziana.org/index.php/events>. We are looking forward to your visit!

In the second article Massimo Meregalli and Wolfgang Papsch deal with the taxon *Echinocactus platensis* var. *leptanthus* described by Spegazzini in 1905.

Enjoy your reading!

We would like to thank Mrs Iris Blanz (Austria), Mr Brian Bates (Bolivia) and Mr Graham Charles (Great Britain), who support us with the translation into English, Mrs Larisa Zaitseva for the translation into Russian and Mr Victor Gapon (both Russia) for the content corrections of the Russian edition, Mr Takashi Shimada (Japan) for the translation into Japanese and Mr. Daniel Schweich (France), who reflects our publication below: <https://www.cactuspro.com/biblio/>.

## A sensational discovery from the utmost northwest of Paraguay – *Gymnocalycium cabreraense* spec. nov.

### Volker Schädlich

Bergstraße 1, 03130 Spremberg (Germany)

E-mail: [volker@gymnos.de](mailto:volker@gymnos.de)

### Ludwig Bercht

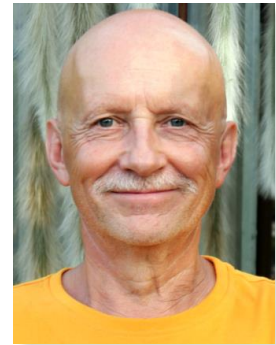
Veerweg 18, NL 4024 BP Eck en Wiel (The Netherlands)

E-mail: [ludwigbercht@hetnet.nl](mailto:ludwigbercht@hetnet.nl)

### Michael Melojer

Nazario Sauro Str. 19/B; 39055 Leifers (Italy)

E-mail: [michael.melojer@gmail.com](mailto:michael.melojer@gmail.com)



### ABSTRACT

Michael Melojer made a sensational new discovery in 2010 in a remote location in the Gran Chaco in Paraguay, at the foot of Cerro Cabrera, in the very northwest of the country. To gather further information about the new species, Volker Schädlich and Ludwig Bercht and other companions made several trips to the inselberg. Due to adverse circumstances, however, the site could only be reached again in 2016. After years of detailed study of the plants in culture and habitat, the first description of *Gymnocalycium cabreraense* is presented here.

**KEYWORDS:** Cactaceae, *Gymnocalycium cabreraense*, first description.

After the Brazilian rainforest, the Gran Chaco is the second largest contiguous forest area in South America. With its almost 260,000 km<sup>2</sup> it occupies about 60 % of Paraguay's land area.

Geologically, the Chaco is a trough up to 3000 m deep, which was created by the folding of the Andes. Over millions of years the Chaco-trough was filled up with sediments from the Andes (Putzer, 1962). During the long period of accumulation of the Chaco-trough, strong shifts occurred; rocks were pushed to the surface and tectonic heaps were formed (Seibert, 1996).



Fig. 1: On the way to Cerro Cabrera.

For cactus lovers the best-known mountain formation in Paraguay is the Cerro Leon. Here in 1963 Friedrich Ritter discovered two *Gymnocalycium* taxa on one of his expeditions. Later, these two taxa were described as *G. stenopleurum* Ritter and *G. paediophilum* Ritter ex Schütz. More to the north, just across the border with Bolivia, there is the next rocky formation, the Cerro San Miguel. In 1986 Hans-Jörg Jucker discovered, here on the slopes, plants also belonging to the genus *Gymnocalycium*. In 1995 Helmut Amerhauser and companion also visited the Cerro San Miguel. The plants they found were described by Amerhauser as *G. chacoense* (1998).



Fig. 2: The Cerro Cabrera in the very northwest of Paraguay.

As we Alexander Arzberger (Paraguay), Ludwig Bercht (The Netherlands) and Volker Schädlich (Germany) in September 2009 could penetrate for the first time the difficult to access region around the Cerro Cabrera (Fig. 1), all the previous failures from the previous years were soon forgotten. With the discovery of *Gymnocalycium mendozaense* Bercht & Schädlich and a form of *Gymnocalycium pflanzii* (Vaupel) Werdermann it could be stated that it is valuable for a field researcher to examine all the hills in this normally flat landscape.



Fig. 3: The northern slope of the 623 m high mountain

photo: Orlando Hilde.

During their Paraguay trip in October 2010 also Michael Melojer (Italy) and Helmut Amerhauser (Austria) visited the Cerro Cabrera. The road (ca. 55 km between Fortin Gabino Mendoza and Cerro Cabrera) was cleared at that time. In the late afternoon they reached the mountain. Michael Melojer went alone looking for cacti. He didn't have much time, as his companion wanted to go back. Michael Melojer found one plant which was unknown for him. Detailed investigation of the plant resulted in finding an old fruit with some seeds in it. The search for more plants was unsuccessful.

After returning home Michael Melojer sent pictures and some seeds to the first author. Very soon it was clear, on the basis of the seed structure and the characteristics of the plant, that up to that time this taxon was completely unknown.

In 2012 Alexander Arzberger, Christian Hefti (Switzerland) and Volker Schädlich had the intention to go to the Cerro Cabrera again. Unfortunately, it was not possible. The road was reclaimed by nature and moreover fallen trees blocked it even more.



Fig. 4: Seedlings of *G. cabreraense*.

In the first days of October 2016 Michael Melojer, Ludwig Bercht and Volker Schädlich tried again to reach the Cerro Cabrera. The car we had was a 25 years old Land Cruiser (not via a car rental), so we had no hard feelings about the car. After an exciting trip together with many scratches in the paintwork and the loss of some ornamental strips we were very happy to reach the mountain (Fig. 2 and 3). Now we only need to find the cacti. From the indications of Michael Melojer, we had uploaded, in preparation for the journey, the approximate place in our GPS devices. It now was the hard work to go through the shrubs. We found the plants in larger amounts, from seedlings up to adult plants (Fig. 4-7).



Fig. 5: Also, adult plants are solitary.



Fig. 6: Adult plants reach a diameter up to 120 mm.

The find was so extraordinary that a more precise examination seemed necessary. Plants were grown from the collected seeds and studied in detail. For this reason, the following is the first description of these plants, which have many unique characteristics and differ from all other *Gymnocalycium* species.



Fig. 7: The plants grow in dense overgrowth.



## ***Gymnocalycium cabreraense* Schädlich, Bercht & Melojer species nova**

### Diagnosis:

Differs from *G. chiquitanum* Cárdenas, *G. paediophilum* Ritter ex Schütz and *G. chacoense* Amerhauser in a not offsetting character, flat body, fewer ribs which are not divided in tubercles and a different seed structure.

### Typification:

The plants are growing on rocky hill slopes of the Cerro Cabrera, Province Alto Paraguay, Paraguay under shrubs and low trees, altitude 482 m. First discovery October 24<sup>th</sup>, 2010.

### Herbarium material:

Cultivated plants grown from seeds collected in the habitat. Holotypus: Melojer MJ 2010-13 (Herbarium WU 4039).

### **DESCRIPTION**

**Body:** solitary, depressed globose, up to 120 mm diameter and up to 70 mm high, epidermis matt greyish green to blue grey, crown sunken, woolly, fibrous roots.

**Ribs:** 7(8), straight, broad, flat, no tubercles, no cross cuts, broader at the base.

**Spines:** 5 (-7) prickly, stiff, more or less recurved, 10-17 mm long, in adult plants 0-1 central spine, erect, ca. 13 mm long. Spines in the middle of the ribs ca. 0.7 mm thick, blackish to dark red brown, later on becoming grey.

**Areoles:** round to somewhat elliptic, initially with some whitish wool, later greyish and bare, 0.4 mm in diameter, distance between the areoles on the ribs ca. 10 mm.

**Flowers:** in the crown, up to 60 mm long, funnel-shaped, at full opening up to 40 mm broad, whitish, throat purple red. Pericarpell light purple-lilac, 10 mm high and 8 mm thick, scales in the same colour, spatulate with a small tip, the edge yellowish-white. Receptacle inside purple-rose, more lighter coloured higher up, 20 mm high, outside purple-lilac, scales elliptical, 6 mm broad and 7 mm high, yellowish white, to the top red-purple. Outer perianth segments rose-brownish, inner petals whitish, 20-25 mm long, spatulate, 7 mm broad, on the outer side with a white-yellow-greenish midstride, at the tip purple-rose. Primary filaments inserted 2-8 mm above the bottom of the nectar chamber, purple-rose, anthers 1-1.5 mm long pollen yellowish, the primary filaments with their anthers not rising above the stigma. Secondary filaments ca. 100, inserted from 12 mm above the bottom of the nectar chamber up to the insertion of the inner petals, rose, the upper ones light rose to the anther yellowish white, anthers as with the primary filaments. Secondary filaments curved inside and reaching above the stigma. Style 16 mm long, light rose to the stigma lighter, stigma 5 mm, yellowish white.

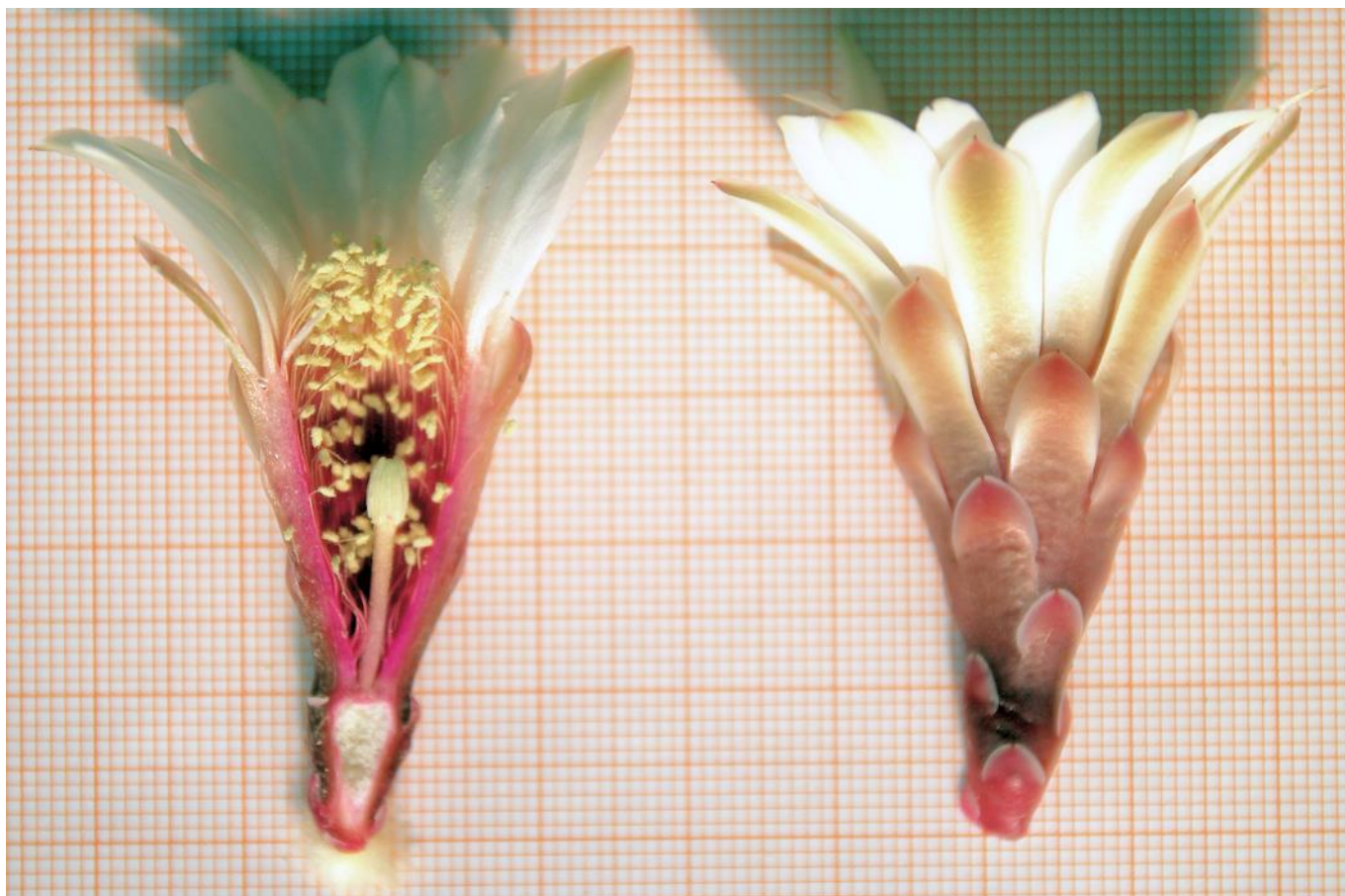


Fig. 8: *G. cabreraense* longitudinal section of the flower.



Fig. 9: *G. cabreraense* ripe fruit.

Fig. 10: *G. cabreraense* dry fruit.

**Fruit:** elliptical, bluish-red when ripe, up to 12 mm long and 9 mm broad, with some grey-whitish small scales, 2.5 mm broad and 1-1.5 mm long, dehiscing vertically, pulpa whitish, ca. 300 up to sometimes 500 seeds.

**Seeds** nearly globose up to somewhat elliptical, towards the basal Hilum-Micropylar-Region (HMR) straight or somewhat slanted shortened. Length 0.80-1.05 mm, M (30) = 0.938 mm, 0.75-0.90 mm, M (30) = 0.827 mm wide. Testa black, shiny. Testa cells isodiametric, outer cell walls very few convex, very rarely somewhat submerged, without or occasionally with weak cuticular striations. Anticlinal walls (standing vertical to the surface) absent or only sparsely visible. Cell corners sunk somewhat to mostly very deep, rarely extended short sharp conical. HMR large, more or less irregular broad elliptical, often in the direction of the ventral side to the top somewhat curved upwards. Micropyle visible, not outstanding above the edge of the HMR. Funiculus break not always clearly visible. Edge of the HMR narrow, not thick, mostly somewhat bending outside.



Fig. 11: Macro photo of the seeds of *G. cabreraense*.

**Habitat:** the plants are growing on the rocky slopes of the Cerro Cabrera. In the neighbourhood there is also growing *Gymnocalycium mendozaense* Bercht & Schädlich, *Gymnocalycium pflanzii* (Vaupel) Werdermann, *Cleistocactus baumannii* (Lem.) Lem., *Cereus hankeanus* F.A.C. Weber ex K. Schum., *Castellanosia caineana* Cárdenas and *Bromelia* spec.

**Etymology:** The species has been named after the mountain Cerro Cabrera in the utmost northwest of Paraguay. Directly west of the massive there is the border with Bolivia.

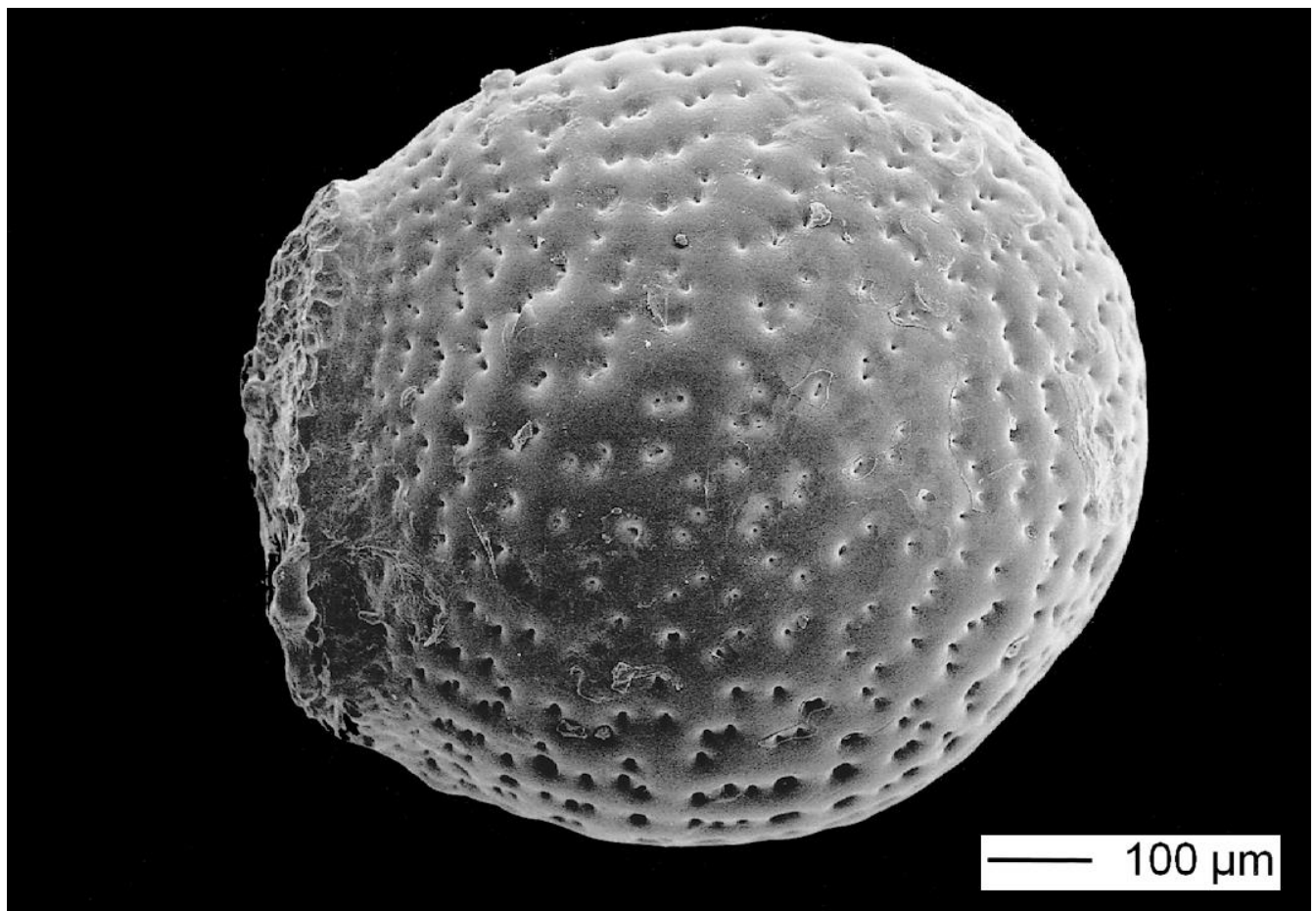


Fig. 12: *G. cabreraense*, lateral view of the seed.

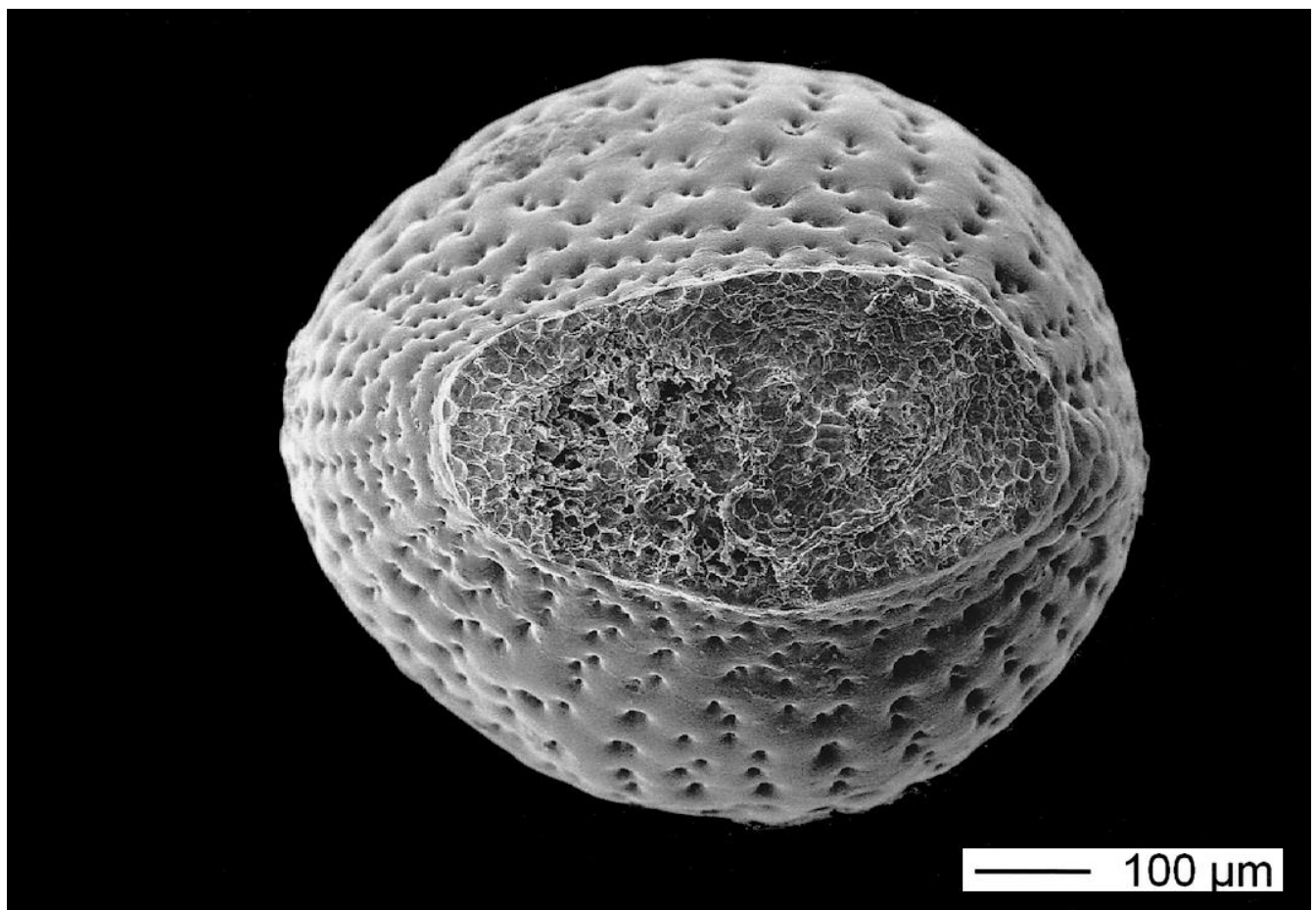


Fig. 13: *G. cabreraense*, Hilum-Mikropylar-Region.

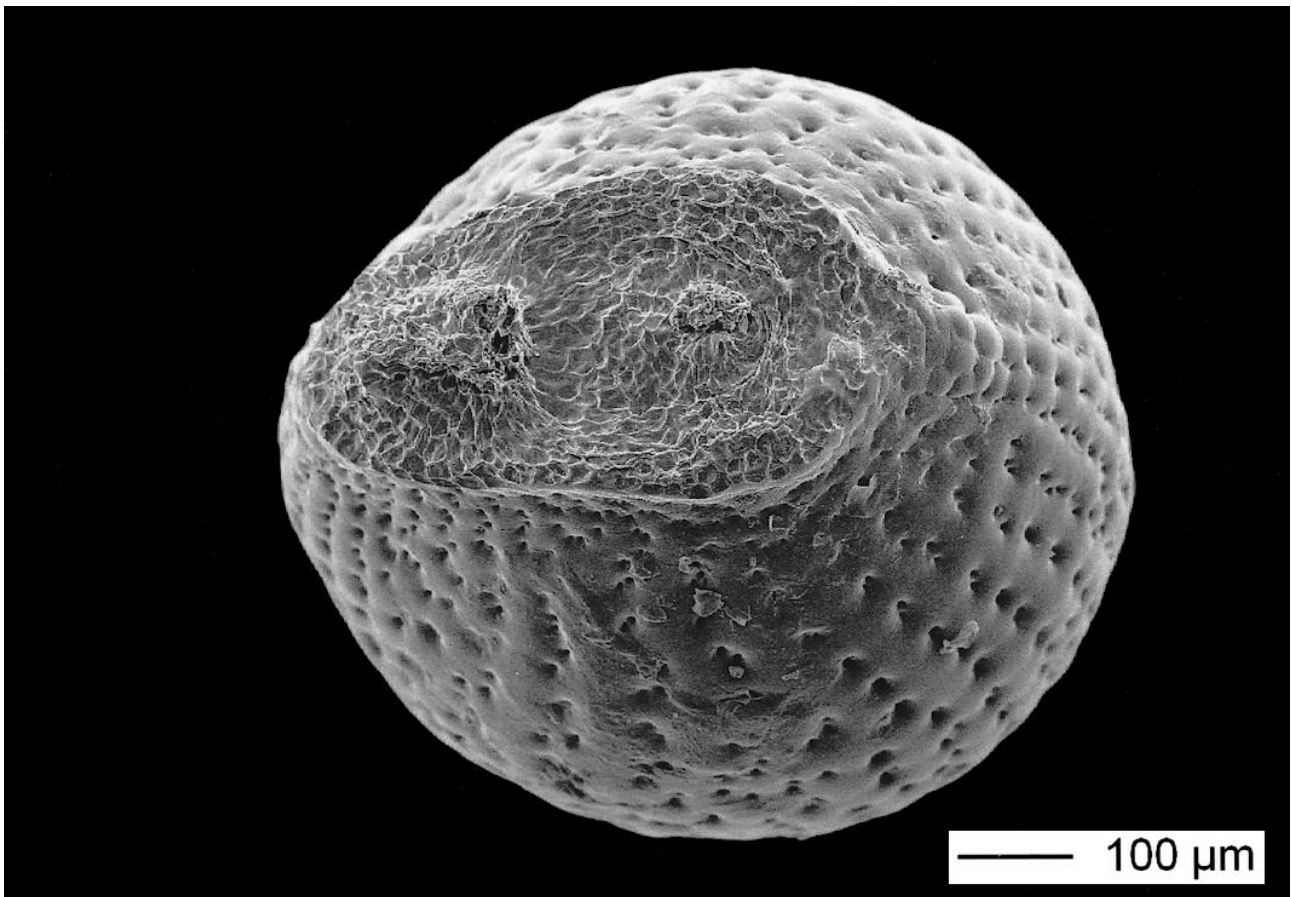


Fig. 14: Sight somewhat oblique of the Hilum-Mikropylar-Region; right from the mid the short conical somewhat outstanding micropyle; to the left from the mid the broad irregular break of the funiculus.

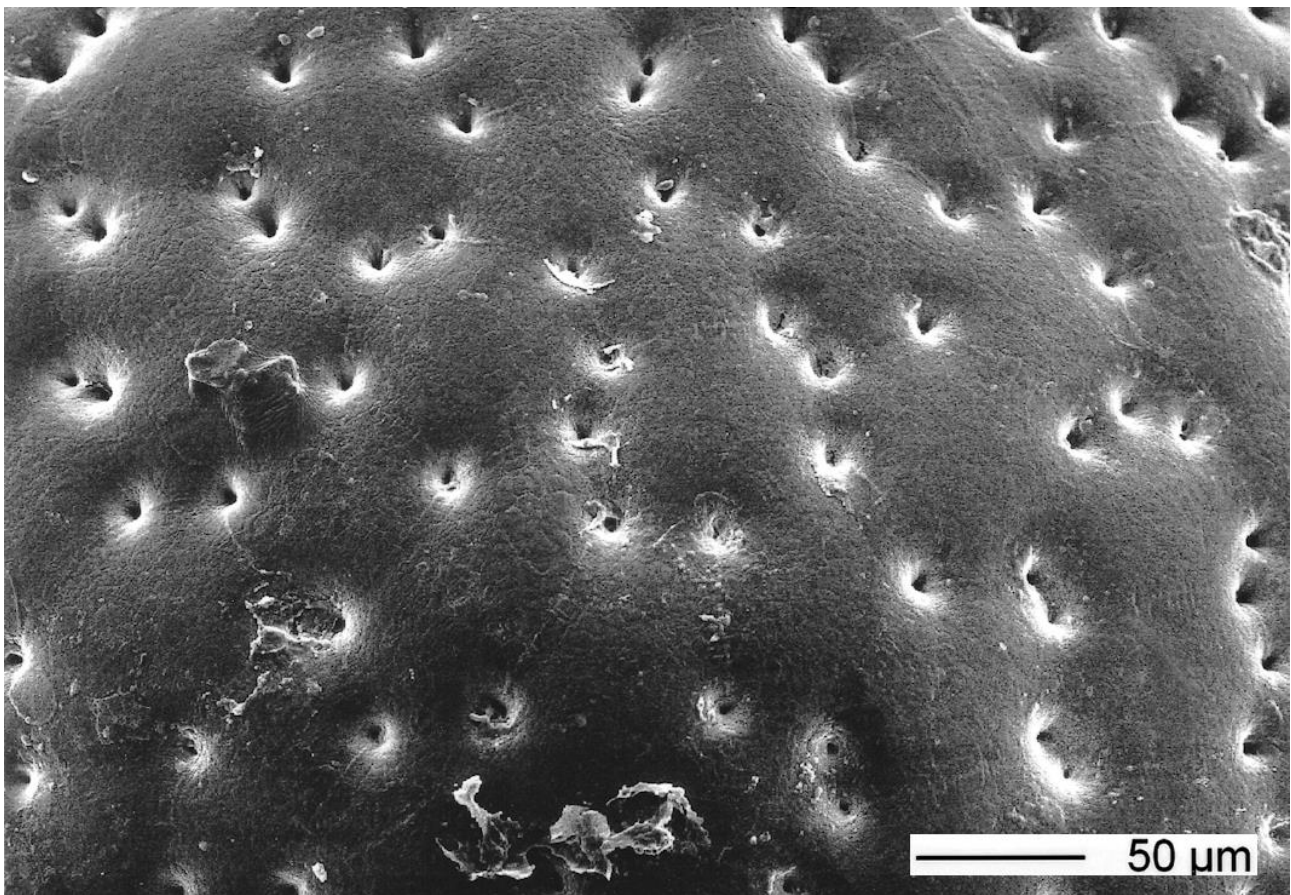


Fig. 15: Section of the side of the seed. Testa cell outer walls somewhat convex, without visible cuticular striations. Anticlinal walls not visible or only indicated; cell corners sunken very deep.

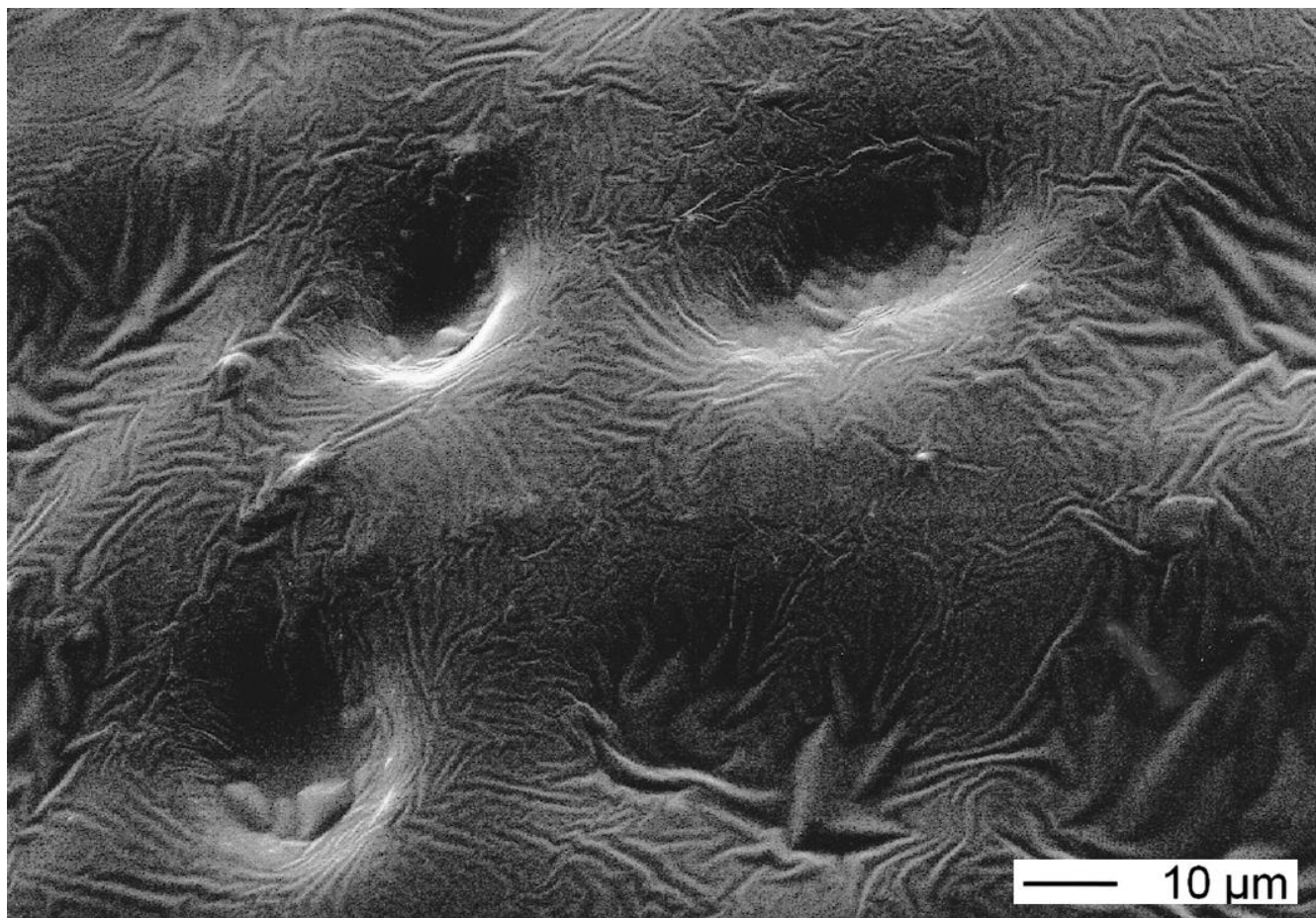


Fig. 16: Off and on presence of light cuticular striations, here the cell corners few to clearly sunken.

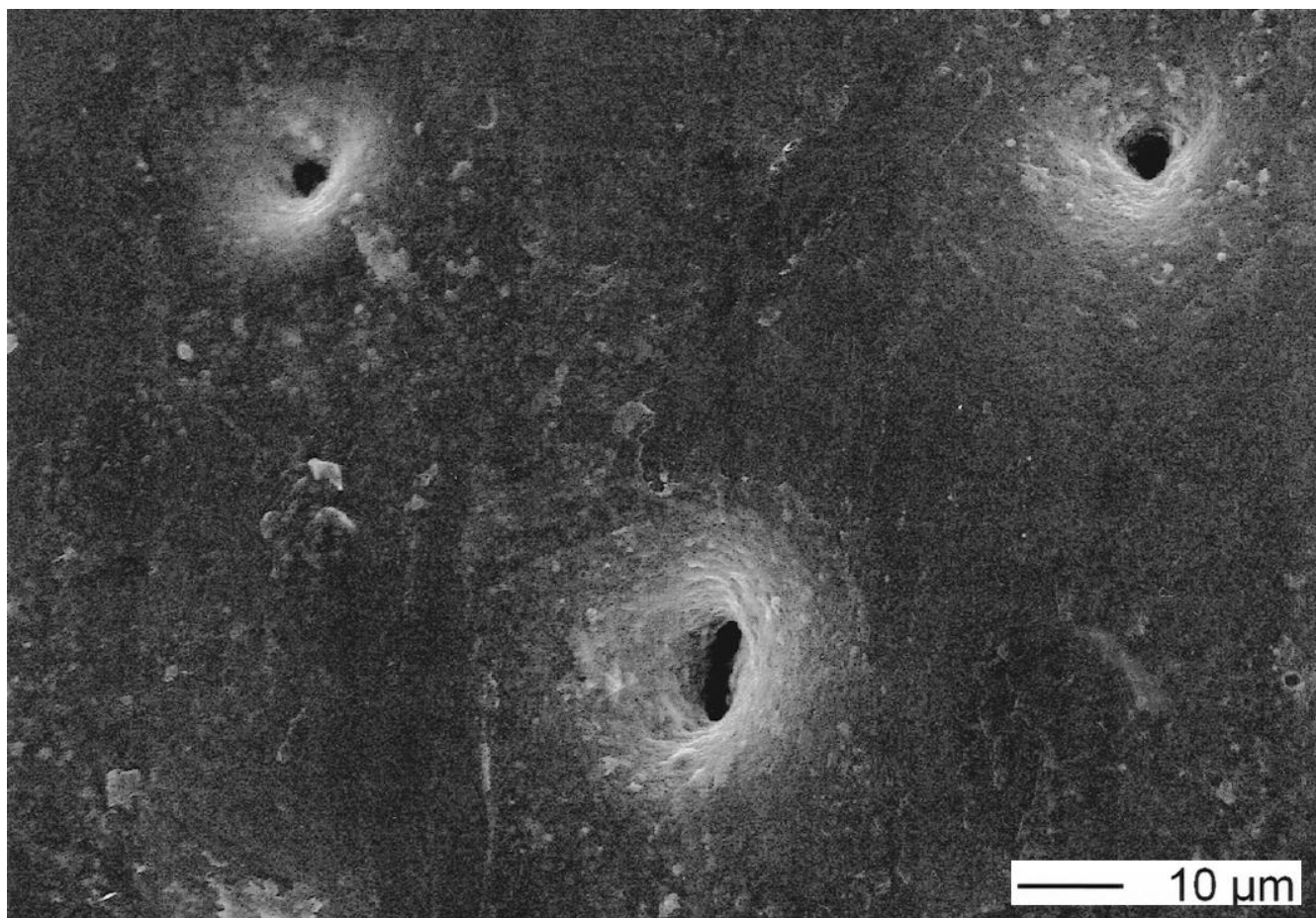


Fig. 17: The nearly holes of the deep sunken cell corners.

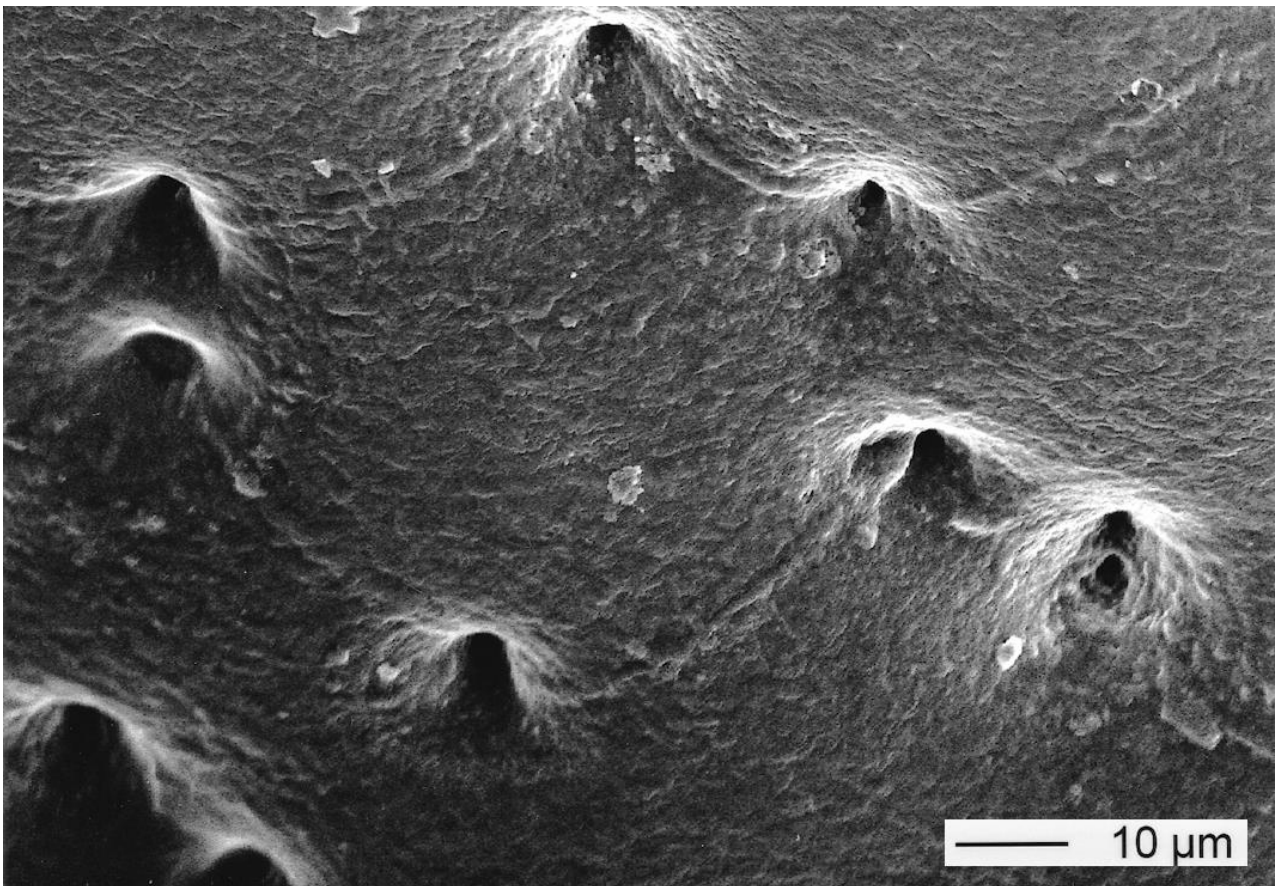


Fig. 18: Rarely the cell outer walls have been sunken somewhat concave; than the cell corners can be seen a little bit conical upright. The anticlinal walls are visible here as narrow flat connections between the upstanding cell corners.

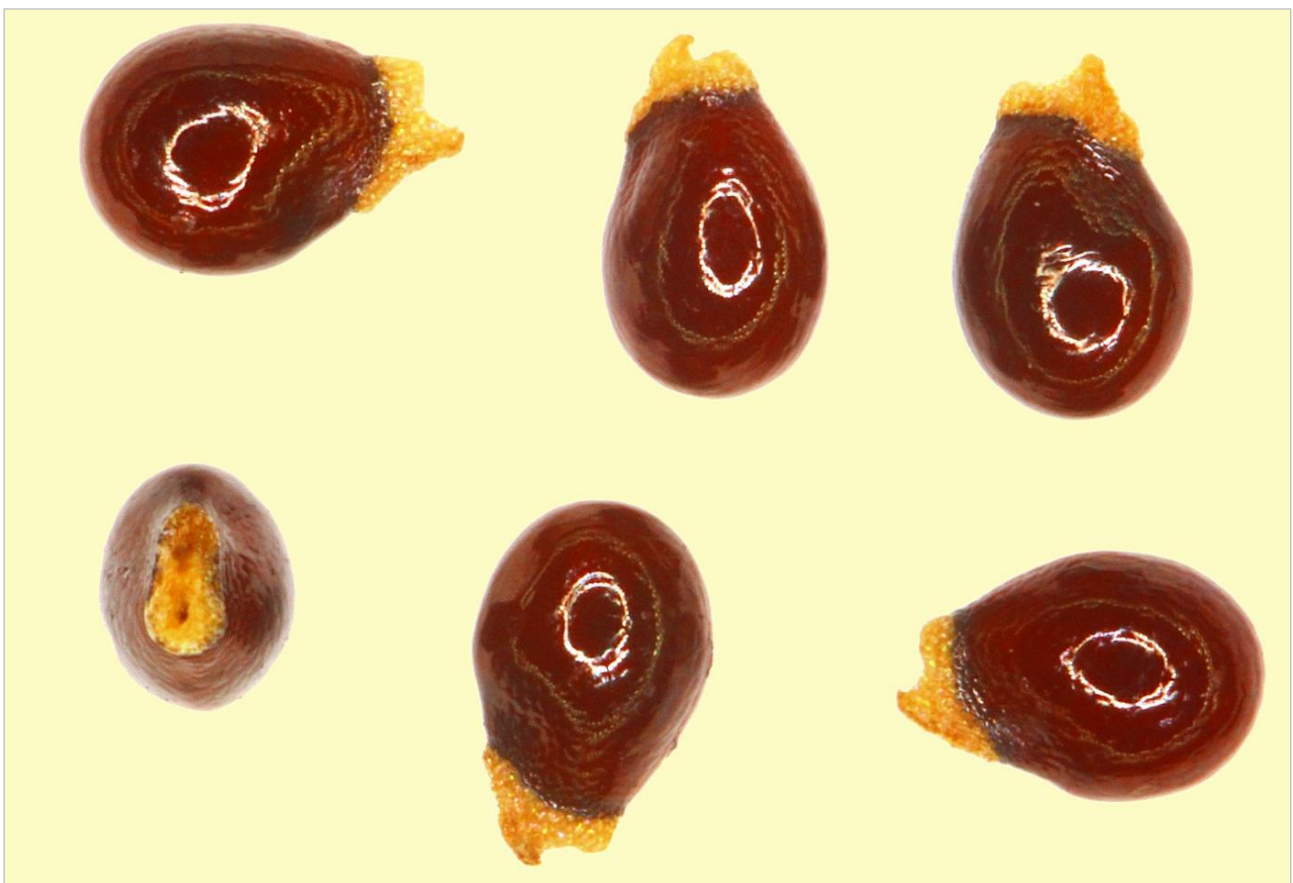


Fig. 19: *G. pflanzii*, macro photo of the seeds.

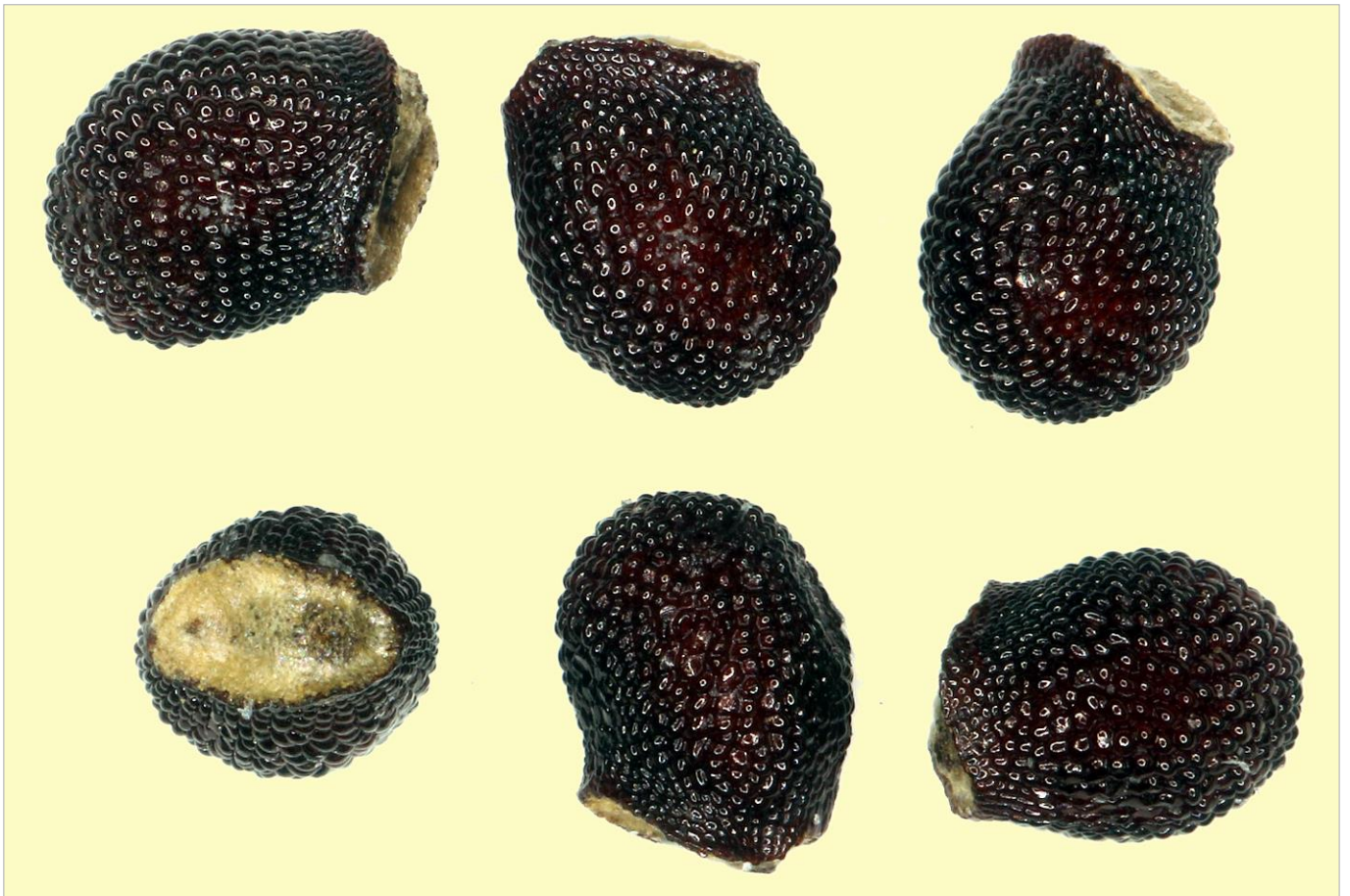


Fig. 20: *G. chiquitanum*, macro photo of the seeds.

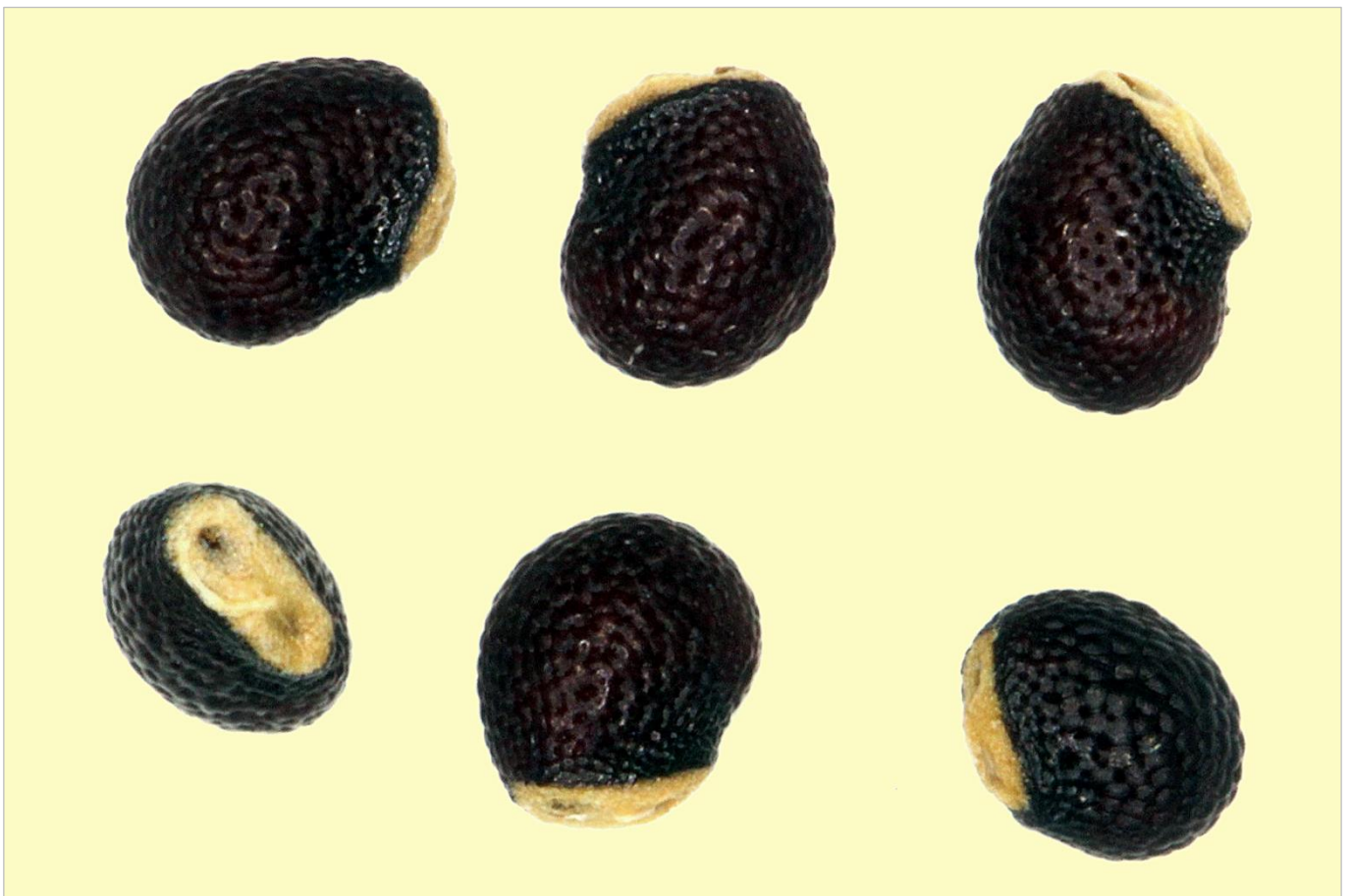


Fig. 21: *G. saglionis*, macro photo of the seeds.



## DISCUSSION

The discovery of these endemic plants was for us an enormous sensation. Taking into account the gigantic circumference of the Chaco it is not surprising to face here with several ecosystems. On such isolated rocky formations like the Cerro Cabrera plants could develop which are in many characters different from the other species of *Gymnocalycium*. The flowers of *G. cabreraense* show similarity with those from *G. chiquitanum* and *G. paediophilum*. The flowering period in nature as well as in culture is in the summer. The flowering time of *G. chiquitanum* and *G. paediophilum* starts in spring. We presume that the closest relatives of the new species are *G. pflanzii*, *G. chiquitanum* and *G. paediophilum*. The high glossy surface of the seeds with hardly visible cell structure can also be found by seeds of the cacti belonging to the subgenus *Pirisemium* (Fig. 19 and 20). Interesting are the like gaps deep sunken cell corners. Such similar gaps can also be found in *G. saglionis* (F. Cels) Britton & Rose (Fig. 21).

Due to the unusual combination of seed traits, it is not yet possible to classify them into a subgenus; further investigations will follow.

## ACKNOWLEDGMENT

Very sincerely we like to thank Prof. Dr. Lothar Diers (Bad Neuenahr/Germany) for his help in the interpretation and description of the seeds as well as the preparation of the REM photos. Also, we like to thank Mr. Orlando Hilde (Filadelfia/Paraguay) for the permission to reproduce one of his photos.

Unless otherwise stated, all figures are by the authors.

## LITERATURE

- Bercht, L.; Schädlich, V. (2015): *Gymnocalycium mendozaense* spec. nov. - eine schon lange bekannte Pflanze aus dem Norden Paraguays. - *Gymnocalycium* 28(3): 1171-1182.
- Cárdenas, M. (1963): *Gymnocalycium chiquitanum* Card. spec. nov. - *Cactus* (Paris) 18(78): 95-97.
- Putzer, H. (1962): *Geologie von Paraguay*. - Gebrüder Borneträger, Berlin.
- Ritter, F. (1980): *Kakteen in Südamerika Band 1 und 2*. - A. Bernecker, Melsungen.
- Schütz, B. (1977): *Gymnocalycium paediophylum* Schütz sp. n. - *Kaktusy* 13(5): 100-101.
- Seibert, P. (1996): *Farbatlas Südamerika*. - E. Ulmer, Stuttgart.
- Till, H.; Hesse, M. (1985): Eine neue Untergattung von *Gymnocalycium* (Cactaceae): Subgenus *Pirisemium*. - *Pl. Syst. Evol.* 149(1-2): 149-153.

## ***Gymnocalycium leptanthum* and *Gymnocalycium parvulum***

### **Massimo Meregalli**

Dept. of Life Sciences and Systems Biology  
Via Accademia Albertina 13, I-10123 Torino (Italy)  
E-mail: [massimo.meregalli@schuetziana.org](mailto:massimo.meregalli@schuetziana.org)



### **Wolfgang Papsch**

Ziehrerweg 5, A-8401 Kalsdorf (Austria)  
E-mail: [wolfgang.papsch@schuetziana.org](mailto:wolfgang.papsch@schuetziana.org)



### **ABSTRACT**

In 1905, Spegazzini described *E. platensis* var. *parvulus* (as "*parvula*") without illustrations. An herbarium undated sheet conserved in Buenos Aires with a Spegazzini's handwritten label consisting of five longitudinally sectioned half-flowers. These flowers evidently were prepared from different plants (and also very likely from different species). So it seems that Spegazzini applied the name *parvula* to different species.

**KEYWORDS:** *Cactaceae*, nomenclature, *Echinocactus leptanthus*, *Gymnocalycium leptanthum*, *Echinocactus platensis* var. *leptanthus*, *Echinocactus platensis* var. *parvulus*, *Gymnocalycium parvulum*, *Gymnocalycium calochlorum*.

### **INTRODUCTION**

The topic of the last *Gymnocalycium* workshops held in Carmagnola (Turin, Italy) in 2016 was a study of the *Gymnocalyciums* of the subgenus *Gymnocalycium* from the Córdoba province characterized by the black seed, lacking a distinct cuticle [(*G. capillense* (Schick, 1923) Hosseus, *G. calochlorum* (Boedeker, 1932) Y. Ito, *G. parvulum* (Spegazzini, 1905) Spegazzini]. During the discussion, the application of the name *G. leptanthum* (Spegazzini, 1905) Spegazzini came to the light. This name was also the subject of a study by Papsch (2015a). Based on the available documentation, it seems clear that the plants that were described by Spegazzini as *Echinocactus platensis* var. *leptanthus* were collected around the city of Cosquin on January 18<sup>th</sup>, 1899 (Papsch 2015b). Also, in 1905, Spegazzini described *E. platensis* var. *parvulus* (as "*parvula*").

## ***Gymnocalycium parvulum* (Spegazzini, 1905) Spegazzini**

Original description of *Echinocactus platensis* var. *parvula*

"*Cormus e globoso-ellipticus, parvus v. pusillus (10-30 mm diam. et alt.) sordide cinereo-virescens; costae saepius 13 rectae, obtuse multituberculatae; aculei 5-7, subsetacei saepe flexuosi valde adpressi (2-4 mm long.) cinerascens-albidi omnes radiantes; flores erecti pro cormi statura magni (45-60 mm long.), tubo perigonalis gracili petala alba sat superante.*"

English translation:

Body globose-elliptical, small to very small (10-30 mm diameter and height), dark greyish-green, often 13 ribs, obtusely multituberculate, with 5-7 flexible, setaceous spines, strongly appressed to the body (2-4 mm long), white-greyish, all radial; flowers erect, larger than the body (45-60 mm long), perigonal tube (= pericarpel) narrow, quite longer than the white petals.

### **DISCUSSION**

There is no information on where the plants used for the description were found, but they may have the same area of origin as the type of *G. leptanthum*: Spegazzini (1905) as the general distribution of *Echinocactus platensis* indicated is in fact the Sierras in the Buenos Aires province, and the surroundings of Córdoba (*Vulgatus in montuosis aridis Sierras pampeanus (Ventana, Curámalál, Olavarria etc. et prope Córdoba)*). The specification of the pampine Sierras refers to the type form of the species, thus the origin of all the varieties should be around Córdoba.

There is an undated herbarium sheet conserved in Buenos Aires, (Fig. 1), with a Spegazzini's handwritten label saying "80 / *Echinocactus / parvulus*" that consists of five longitudinally sectioned half-flowers (thus at least three flowers). These flowers evidently were prepared from different plants (and also very likely from different species). So, it seems as Spegazzini applied the name *parvula* to different species. The document LPS 23076 (LP) is correctly labelled "*E. platensis ex Córdoba f. leptantha 18-I-99*" by Spegazzini. However, the inscription of this herbarium sheet with "*Echinocactus parvulus*" collides with the original description of this taxon as a variety of *E. platensis*. However, since the corresponding sheet part is correctly marked as "*E. platensis* var. *parvulus*", this document can still be regarded as the type (Kiesling 1984). Since there is no clear evidence that the sheet was prepared after the description, its validity as the type of *E. platensis* var. *parvula* is anyway correct, following art. 9 of the ICBN. Less easy to explain is the discrepancy between part of the flowers and the description. This may lead us to think that the sheet was prepared after the description, using flowers from the plants that had been used to describe the taxon, and that had not yet flowered when the paper was prepared. However, this is too much of a speculation, and we cannot reject the use of the sheet as the type of *Echinocactus platensis* var. *parvulus*.

H. Till & W. Till (1994) designated a lectotype using one of the flowers (sectioned, thus two half-flowers) of the sheet. This flower is the only one that does not contrast with the description, and the typification must be accepted. Anyway, an epitype to clarify the interpretation of the name should be deposited, since the flower only allows to exclude some species, but not to correctly identify the taxon.

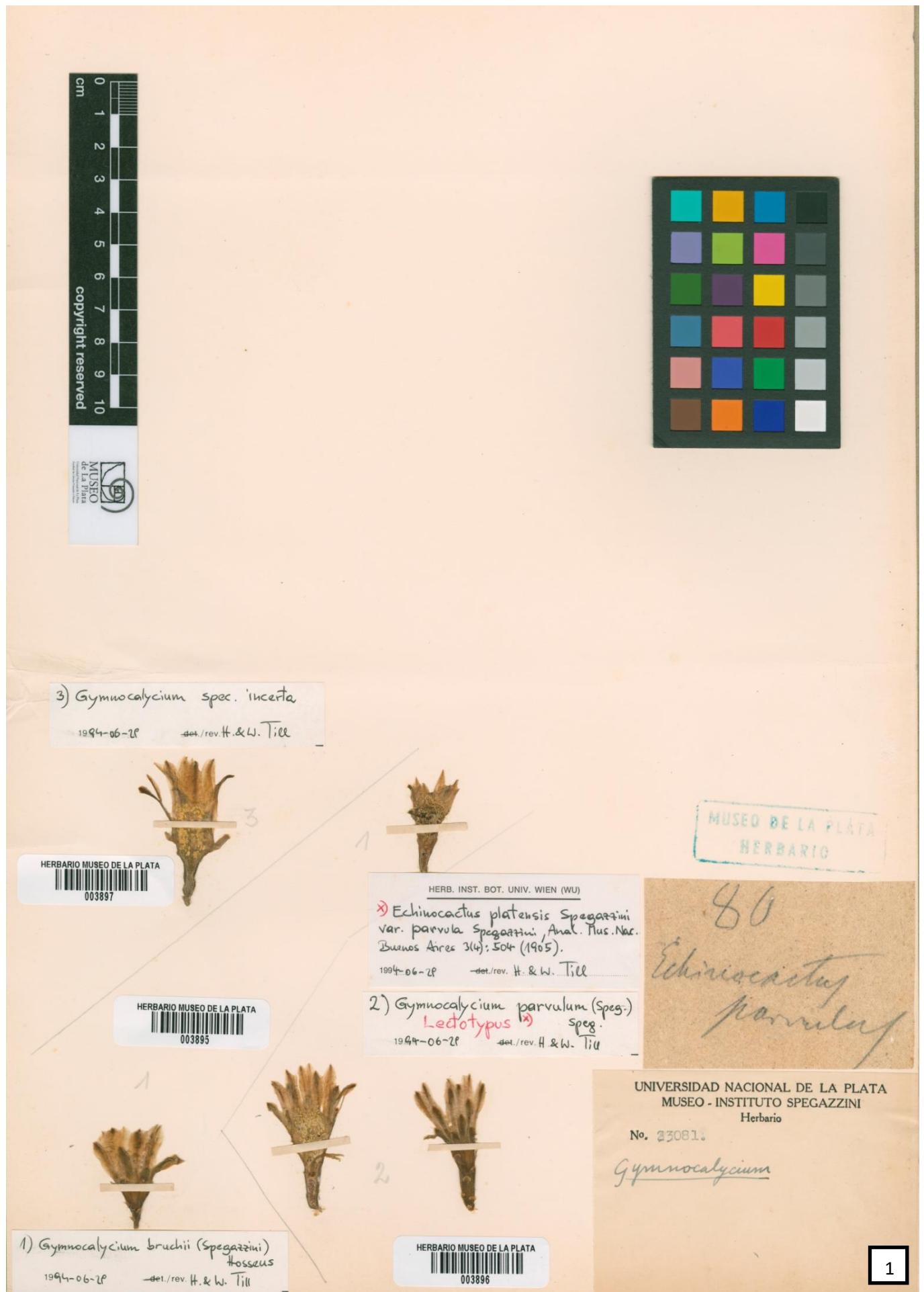


Fig. 1: Herbarium sheet with Spegazzini's handwritten label.

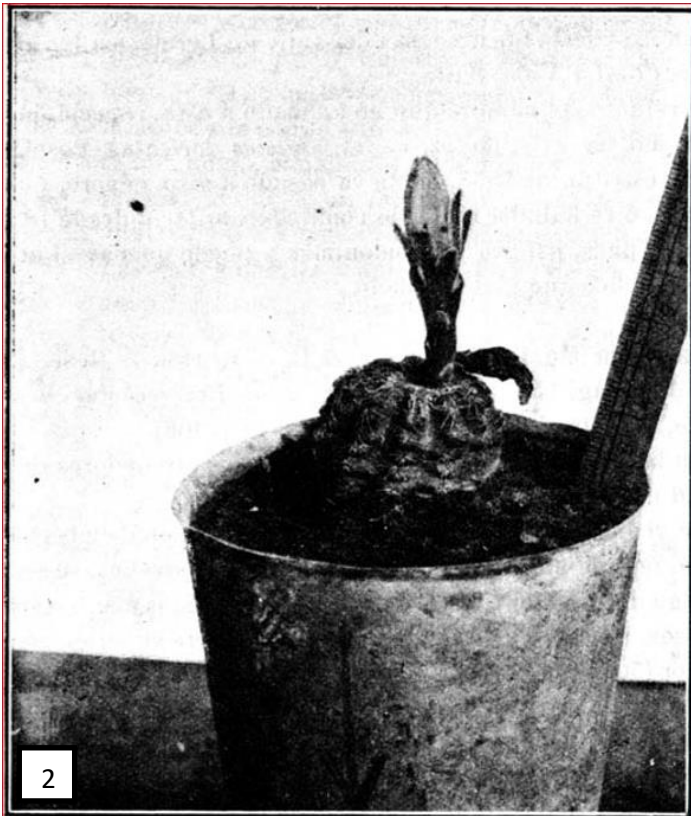


Fig. 2-3: *E. platense* var. *parvulus*, Spegazzini 1925 (2), Font 2016 (3).



Fig. 4-5: *E. platense* var. *leptanthus*, Britton & Rose 1922 (4), Font 2016 (5).

Twenty years later Spegazzini (1925) proposed a key to the species of *Gymnocalycium*, based on the flower shape, and in upgrading his two varieties *leptantha* and *parvula* to species rank, recombining them in the genus *Gymnocalycium*. Extracting only the key to these two species, we have the following:

- |    |   |  |
|----|---|--|
| 1  | Flowers tapered at the base, ovary more or less developed, but always clearly visible .....   | 2                                      |
| 2  | Stamens in two distinct series, the inner one surrounding the base of the style, the other one above, at the throat of the perianth tube, and more numerous .....                                 | 4                                      |
| 4  | Stigma lobes 5-8.....   | 5                                      |
| 4  | Stigma lobes 10-15.....   | 8                                      |
| 5  | Length of the ovary more than one third of the overall length of the flower, flower 60 mm long (ovary 28 mm long) .....   | <b><i>Gymnocalycium leptanthum</i></b> |
| 8  | Average flowers 70 mm long. Ovary shorter than one quarter of the overall length of the flower (author's note: > 17 mm when overall flower length is 70 mm) .....                                 | 9                                      |
| 9  | Style elongated, stigma surpassing the lower stamens by far, often the upper ones, too .....  | 13                                     |
| 13 | Petals as long as perianth tube or longer, lower part of the perianth in the form of inverse cone shaped to discoid.....  | 14                                     |
| 14 | Petals shorter than 30 mm, style shorter than upper stamens.....  | 15                                     |
| 15 | Ovary only one fifth of the overall length of the perianth (so 14 mm for an overall flower length of 70 mm, if the flower length of the protologue is used, the length is only about 10 mm) ..... | 16                                     |
| 16 | Ovary from discoid to almost cylindrical, merging flat into perianth at the outside .....   | <b><i>Gymnocalycium parvulum</i></b>   |

So, according to Spegazzini, *G. leptanthum* can be keyed out from *G. parvulum* (and many other species) based on the number of the stigma lobes, that do not exceed 8, whereas there are 10 or more in *G. parvulum*.

Comparing the key with the protologue of *G. parvulum*, some differences can be noticed. In the protologue the flower length is between 45 and 60 mm, whereas in the key the flower is 70 mm long. The second point of distinction is the ratio between pericarpel and length of the perianth segments. In the protologue the pericarpel is described as being "quite longer" than the "petals". In the key there is no mention of the pericarpel, but only the indication to the ovary is given. Spegazzini (1925) specified that he measured the ovary from the external part, thus it should be considered as the pericarpel. In *G. parvulum* the ovary is said to be only one fifth of the length of the perianth, a size that is difficult to adapt to the original description where the perigonal tube is said to be longer than the petals. Hence, it is not clear if Spegazzini in 1925 simply had more information that allowed him to emend the original description of *G. parvulum*, or if in the 20 years that passed after his first description he made some mistakes and misinterpreted the species. In the text regarding *G. leptanthum* he referred to having deeply studied his notes and the drawings of the species (but not plants), yet he published a photograph of a plant (Spegazzini 1925: 139) (Fig. 2). This photo does not have any information on when it was taken, thus it could be any time

between 1905 and 1925, and it can be referred to a plant that was identified as *G. leptanthum* by Spegazzini, but not necessarily to a plant part of the original material. Moreover, as already recognized by Papsch (2015b), the photograph does not correspond with the description of *G. leptanthum*, but it fits pretty well with the description of *G. parvulum*. So Spegazzini has probably confused the photographs when these were selected for his 1925 paper. An indication of this is the picture in the herbarium of the Museum of Pharmacobotany "Juan A. Domínguez" (BAF). It shows the same plant but Spegazzini has put the name right in the picture (Font 2016: 60) (Fig. 3).

A photograph of a plant that is included among the type material was reproduced by Britton & Rose (1922: 164, Fig. 170) without a picture caption usual for Spegazzini (Fig. 4). In the Herbarium of the Museum of Pharmacobotany "Juan A. Domínguez" (BAF) there is the same picture, but now with the inscription "*Gymnocalycium platense* (Speg.) B. & R. *vr. leptantha*" in Spegazzini's handwriting (Font 2016: 60) (Fig. 5).

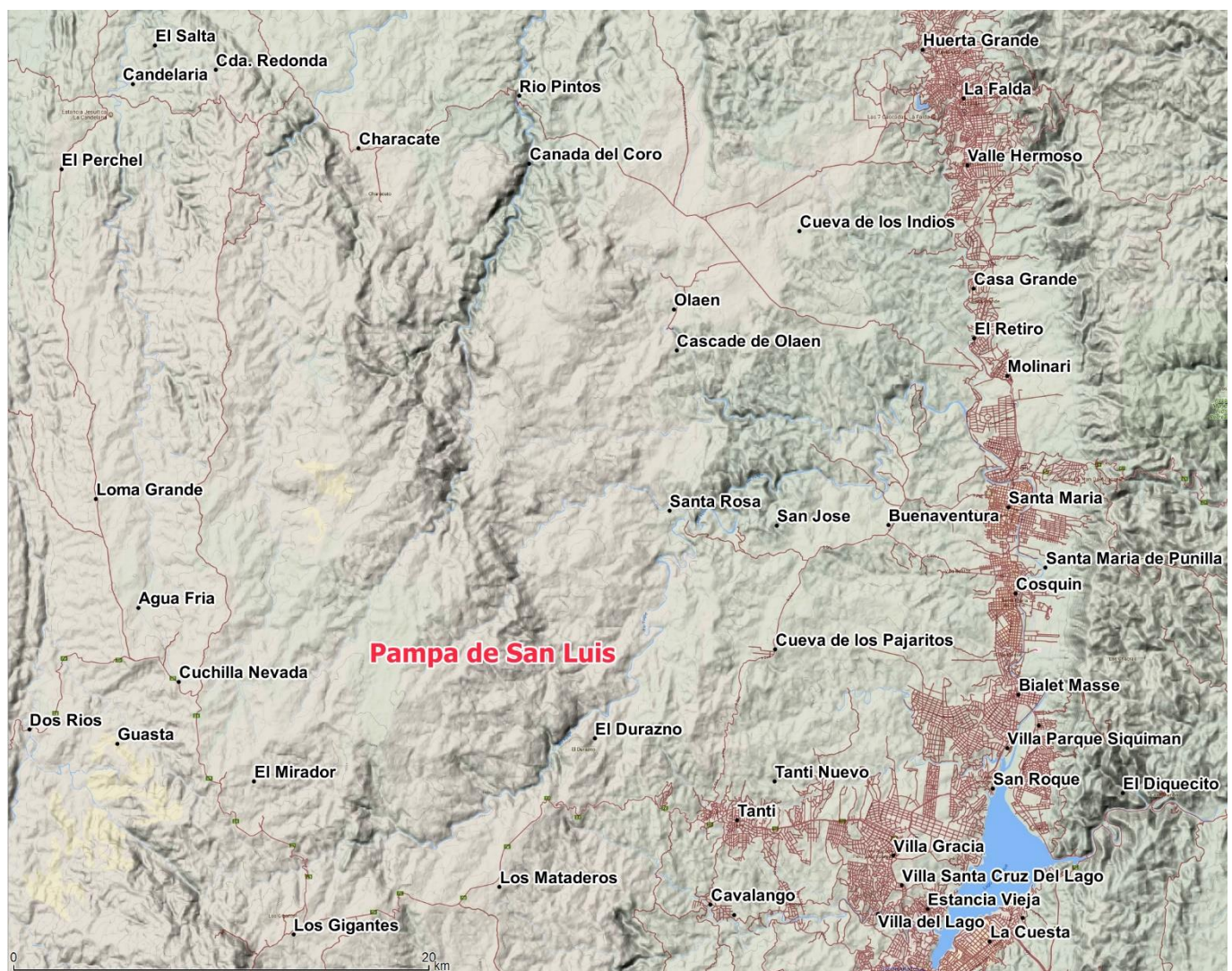


Fig. 6: Geographical location of the Pampa de San Luis (map: M. Wick).

The type locality of *G. parvulum* is equally uncertain. In the original description, only the surrounding of Córdoba was indicated as the range of *E. platensis* in the broad sense, including the varieties. In 1925 Spegazzini added "En las colinas más pedregosas y secas de la sierra de San Luis" (in the rockiest and driest hills of the sierra de San Luis). This "San Luis" indication caused several subsequent misinterpretations. It is certain that it must be a place in the province

of Córdoba, as indicated by Spegazzini (1905). However, Katinas (2004), based on a personal communication by Leuenberger (who indeed simply referred to Spegazzini 1925) indicated the mountain ranges of San Luis, thus implicitly referring to the province of San Luis. Possibly following this paper, Hunt (2006), explicitly reported the province of San Luis for *G. parvulum*.

Till (1994) had previously suggested a different interpretation. Locating a "San Luis" very near to Panaholma, in the western side of the Sierra Grande, he referred plants growing in the surroundings to *G. parvulum* (Fig. 6).

This locality seems to be too far from the "surroundings of Córdoba", and we do not know of other plants from that region known to Spegazzini in 1905.

However, not far from Córdoba there is the Pampa de San Luis, a high hill region west of Tanti. We know that this was one of the regions from where the plants described by Spegazzini came, and therefore we can speculate that this is the most likely area of provenance of *G. parvulum*.

### **Identification of *G. parvulum***

Is it possible to positively identify *G. parvulum* Spegazzini? The description itself does not help much and may have been based on more than a single plant - and on more than a single species, at least according to the flowers that were used for the preparation of the herbarium sheet. This is not surprising, since small plants of various species are extremely similar.

Moreover, the size of the flower that was reported in the first description changed in 1925 (45 to 60 mm in 1905, average 70 mm in 1925).

However, since a lectotype exists, we must base the interpretation of the name on the characters that can be derived from the lectotype.

If we accept the Pampa de San Luis as the type locality - or anyway a locality close to Córdoba as stated in 1905 - the original description cannot be applied to many species. Basically, using today's classification, the following species can be considered: *G. calochlorum* (Backeberg 1932) Y. Ito; *G. bruchii* (Spegazzini 1923) Hosseus, *G. bruchii* subsp. *brigittae* (Piltz 1987) Papsch. Also *G. andreae* (Boedeker 1930) Backeberg lives in that region, even though at high altitude, but it can be excluded since it has yellow flowers. All these species, when plants are smaller than 30 mm, have characters that are not in contrast with the original description. A part of the flowers that are part of the herbarium sheet probably belong to *G. bruchii*. These flowers, anyway, do not conform with the description, since they have a very short pericarpel, shorter than the perianth (longer in the description), and also the flower chosen as the lectotype does not belong to a plant of *G. bruchii*. So also, this taxon, as well as *G. bruchii* subsp. *brigittae*, can be excluded, even though we cannot exclude that some plants of *G. bruchii* contributed to the original description.

The flower selected as the lectotype is not in contrast with the species today recognized as *G. calochlorum*. Also, the description itself is not in contrast, even though this species has usually at least 7 spines, often more, whereas the description indicated 5 to 7. But small plants can also have less spines.

Is it possible that Spegazzini (1905) described the same taxon twice, i.e., that *E. platensis* var. *leptanthum* and *E. platensis* var. *parvulus* are indeed synonyms? We know that the form was found in the area around Cosquin, and there is little doubt that it is the same species today known



as *G. calochlorum*, since no other species of this group can be found in that area, with the partial exception of some scattered and usually rare populations referable in the broad sense to *G. amerhauseri* subsp. *altagraciense* H. Till & Amerhauser 2007.

Which are the differences stated in the first description (and not in 1925) between the two species? The two descriptions are not particularly different, except in the size of the plant, and the size of the flower (60-65 mm long). The pericarpel is one third longer than the perianth segments in *G. leptanthum* and "quite longer" in *G. parvulum*. But again, small plants in the first year of flowering may have smaller flowers.

Thus, we cannot exclude that at least parts of the plants that were used for the description of *G. parvulum*, and in particular the plant whose flower was used as the lectotype, were simply small specimens of *G. leptanthum*.

The difference in the stigma lobes cited in the key (Spegazzini 1925) does not seem to have a particular meaning, since there is some variability in this character, even though the majority of the flowers that have been seen from several plants from the region have 10-12 lobes.

As with many old names, the interpretation is basically a speculation, more or less supported by available data. In any case, it is necessary to fix the usage of these names to stabilize once and for all the nomenclature. It seems reasonable, in this case, to use *G. leptanthum* for the species from the surroundings of Cosquin, usually identified as *G. calochlorum*, and refer *G. parvulum* to a synonym of this species.

## NOMENCLATURE

### ***Gymnocalycium leptanthum* (Spegazzini, 1905) Spegazzini**

Nuevas Notas Cactológicas. - Anal. Soc. Cient. Argentinas t. 99: 138.

Basionym: *Echinocactus platensis* var. *leptantha* Spegazzini, 1905

Cactacearum Platensium Tentamen. - Anal. Mus. Nat. Buenos Aires t. 11, p. 504.

#### Synonyms:

*Echinocactus platensis* var. *parvula* Spegazzini, 1905 **syn. nova**

Cactacearum Platensium Tentamen. - Anal. Mus. Nat. Buenos Aires t. 11, p. 504.

*Gymnocalycium parvulum* (Spegazzini) Spegazzini 1925 **syn. nova**

Cactacearum Platensium Tentamen. - Anal. Mus. Nat. Buenos Aires t. 11, p. 141.

*Echinocactus calochlorus* Boedeker, 1932 **syn. nova**

*Echinocactus calochlorus* Böd. sp. n.- Monatsschrift der DKG Bd. 4: p. 206-262.

*Gymnocalycium calochlorum* (Boedeker) Ito, 1952 **syn. nova**

Cacti: 90 (1952).

#### Epitypes:

Are deposited in TO-HG.

## The populations referred to *G. parvulum* from the western side of the Sierra Grande

As previously said, plants very similar to those growing on the eastern side of the Sierra Grande were referred to *G. parvulum* by H. Till & W. Till (1994), between Panaholma and the surroundings of Villa Dolores. More east, from the southern slopes of the Sierra de Guasapampa, *G. parvulum* subsp. *amoenum* was named.

The differences that were indicated between the two forms are low. The seed shape confirms close relationships between them. There appears to be a certain geographic discontinuity between them, a gap that is more or less filled by the Pampa de Pocho - where however only a few populations are known.

How to interpret these disjunct populations is generally subjective. The specimens from the western slopes of the Sierra Grande do not show any particular difference with respect to those from the eastern range, thus we suggest not to separate them, and will unite them under *G. leptanthum*.

The rank to be assigned to the taxon from the southern slopes of the Sierra de Guasapampa is questionable, it can be upgraded to species rank, or maintained as a subspecies of *G. leptanthum*.

## LITERATURE

- Boedeker, F. (1932): *Echinocactus calochlorus* Böd. sp. n. - Monatschrift der DKG Bd. 4: 206-262.
- Britton, N. L.; Rose, J. N. (1922): *Cactaceae III*. - The Carnegie Institution - Washington.
- Font, F. (2016): Carlos Spegazzini: Icones Cactacearum: Photo album and photographs of Cactaceae from Dr. Carlos Spegazzini. - *Dominguezia* 32(1): 60.
- Hunt, D. (2006): *The New Cactus Lexicon*: 132. - dh-books Milbourn Port.
- Katinas, L.; Gutierrez, D.; Torres Robles, S. (2000): Carlos Spegazzini (1858-1926): Travels and Botanical Work on Vascular Plants. - *Anal. Missouri Bot. Gard.*, (87)2: 183-202.
- Katinas, L.; Gutierrez, D.; Torres Robles, S. (2004): Type material of Carlos L. Spegazzini in the Museo de la Plata Herbarium (LP), Argentina III: Cactaceae. - *Darwiniana* 42(1-4): 177-200.
- Kiesling, R. (1984) *Cactaceas, Publicadas por el Dr. Carlos Spegazzini*. - librosur eds - Buenos Aires.
- Meregalli, M. (2015): 9. *Gymnoday*, Carmagnola, 24-26. July 2015.- *Schütziana* 6(3): 2-3.
- Meregalli, M. (2016): 10. *Gymnoday*, Carmagnola (Turin, Italy). - *Schütziana* 7(2): 2-3.
- Papsch, W. (2015a): Was ist der älteste Name für die *Gymnocalycien* der Sierras Bayas. - *Schütziana* 6(2): 3-14
- Papsch, W. (2015b): Ideas occurring when reading the literature about *Gymnocalycium leptanthum* and *Gymnocalycium parvulum*. - *Schütziana* 6(4): 5-16.
- Spegazzini C. (1905): *Cactacearum Platensium Tentamen*. - *Anal. Mus. Nat. Buenos Aires* t. 11, 504-505.
- Spegazzini C. (1925): *Nuevas Notas Cactológicas*. - *Anal. Soc. Cient. Argentinas* t. 99.
- Till, H. (1994): Zur Identität und Verbreitung von *Gymnocalycium parvulum* (Spegazzini) Spegazzini. - *Gymnocalycium* 7(2): 121-126.