

# *Schüttriana*

The Gymnocalycium Online Journal



Volume 7, Issue 1, 2016  
ISSN 2191-3099

This document was made available as a pdf file: March 17<sup>th</sup> 2016

---

## Content

Wick, Mario	<b>Editorial</b>	Page 2
Meregalli, Massimo Kulhánek, Tomáš	<b><i>Gymnocalycium pinali</i>, a new species from the Province of Córdoba.</b>	Page 3-13
Wick, Mario	<b>New finds on the distribution area of <i>Gymnocalycium prochazkianum</i> Šorma</b>	Page 14-36

**Published: March 17<sup>th</sup> 2016**

### 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)

Massimo Meregalli, 10123 Torino, V. Accademia Albertina, 17, Italia, [massimo.meregalli@schuetziana.org](mailto:massimo.meregalli@schuetziana.org)

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

Tomáš Kulhánek, 67201 Moravský Krumlov, Tylova 673, Czech Republic, [tomas.kulhanek@schuetziana.org](mailto:tomas.kulhanek@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 need not being in agreement with the opinion 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.

© 2016 WORKING GROUP SCHÜTZIANA. All rights reserved.

ISSN 2191–3099

**Cover picture: *Gymnocalycium prochazkianum*, south of Quilino, prov. Córdoba, Argentina (photograph: Wolfgang Papsch)**

---

## Editorial



### Dear *Gymnocalycium* friends

There are some *Gymnocalycium* species which had been assumed, in some cases even for decades, to have only a very small distribution area. In an extreme example merely one location was known. This is quite often due to the fact that there are hardly any roads fit for vehicle access in the respective distribution area or that the area is regarded as not attractive enough to search for cactuses. Quite often cactus tourists follow a tight schedule and only few of them tackle the task of an in-depth study of individual species.

These species are, among others, *Gymnocalycium kuehhasii* Neuhuber & Sperling from San Miguel, *G. monvillei* subspec. *horridispinum* (Frank ex H. Till) H. Till from La Mudana, *G. berchtii* Neuhuber from Los Chañares and *G. prochazkianum* Šorma. The latter had been known, for many years, only from its type locality south of Quilino in the Argentinean province of Córdoba. For all the species mentioned, further locations could be found and our knowledge broadened as to their areas of distribution.

This is especially true with regard to *G. prochazkianum*, as at the site of its first description only a few plants could be found and the species was regarded as extremely endangered in its natural habitat.

This issue will report on the discovery of further localities, the appearance and variability of the plants at their locations and, concluding from these facts, the author's view of the relationship between *G. prochazkianum* und *G. simplex* n.n.

... and we present the new description of a *Gymnocalycium* from the natural park "Los Terrones" in Córdoba.

I hope you will enjoy reading this article.

We would like to express our warmest thanks to Mrs Iris Blanz (Fernitz, Austria), to Mr Brian Bates (Bolivia) and to Mr Graham Charles (United Kingdom), who support us with the translation into English, to Mrs Larisa Zaitseva for the translation into Russian (Tscheljabinsk, Russia), to Mr Takashi Shimada (Japan) for the translation into Japanese and to Mr Daniel Schweich (France), who has mirrored our publications under <http://www.cactuspro.com/biblio/>.

## ***Gymnocalycium pinali*, a new species from the Province of Córdoba**

**Massimo Meregalli\***, **Tomáš Kulhánek\*\***

\* 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)

\*\* Tylova 673, CZ-67201 Moravský Krumlov, Czech Republic  
e-mail: [tomas.kulhanek@schuetziana.org](mailto:tomas.kulhanek@schuetziana.org)



### **ABSTRACT**

**The new species *Gymnocalycium pinali* Meregalli & Kulhánek is described. A differential diagnosis in comparison with several other species of subgenus *Gymnocalycium* is given and remarks on the habitat colonized and conservation status are provided.**

### **KEYWORDS**

*Gymnocalycium pinali*, *Gymnocalycium amerhauseri*, *Gymnocalycium erinaceum*, *Gymnocalycium erinaceum* var. *paucisquamosum*, *Gymnocalycium gaponii*, *Gymnocalycium gaponii* ssp. *geyeri*, *Gymnocalycium robustum*, *Gymnocalycium kuehhasii*, *Gymnocalycium campestre*.

### **INTRODUCTION**

During a visit to his collection, our friend Ariel Piñal showed one of the authors (Meregalli) some nice plants found in the northern part of the Province of Córdoba, in the natural park "Los Terrones", between Capilla del Monte and Ongamira. They clearly belonged to the subgenus *Gymnocalycium*, but no certain identification could be suggested. In some aspect small plants reminded of *G. amerhauseri*, that was found not very far from Los Terrones. However, already at the first examination, several striking differences were observed, particularly in the largest specimens.

More observations in habitat and cultivation allowed to gather complete information on this interesting *Gymnocalycium*, and to define its morphological and ecological characteristics.

### **METHODOLOGY**

Several specimens were studied in habitat and cultivation, including seedlings obtained from habitat seeds.

In order to evaluate the taxonomic status of the plants from Los Terrones, morphological characters were compared with those of other species of the subgenus *Gymnocalycium* (Table 1). The species that were chosen were those that shared a certain morphological resemblance,

and those that are present in northern Córdoba: *G. amerhauseri* H. Till, 1994; *G. erinaceum* J. G. Lambert, 1985; *G. erinaceum* var. *paucisquamosum* Piltz, 1994; *G. gaponii* Neuhuber, 2001; *G. gaponii* ssp. *geyeri* Neuhuber & V. Gapon, 2008; *G. robustum* R. Kiesling, O. Ferrari & D. Metzinger, 2002; *G. kuehhasii* Neuhuber & R. Sperling, 2008 and *G. campestre* Řepka, 2015. *G. capillense* (Schick, 1923) Schick, 1926 was excluded from the study since it has different seed shape as well as *G. andreae* (Boedeker, 1930) Backeberg, 1936, growing always at higher altitude and belonging to another species group.

All other species of the subgenus, also from different parts of the Córdoba province and from the San Luis province, are clearly different.

The characters were scored according to plants from the type locality and the protologue.

### ***Gymnocalycium pinali* Meregalli & Kulhánek, sp. nov.**

**Holotype:** Argentina, Córdoba, Sierra Chica, Parque Los Terrones, 30°47'S 64°28'W, 1300 m a.s.l., October 24, 2009, Ariel Piñal & Eduardo Antonio Sande leg., collection number AP-50 (holotype: TO-HG).

More material examined, all from the same locality: same date as the holotype, living plants in coll. Piñal & Sande; September 2, 2010, living plants in coll. Piñal & Sande; MM 1365, February 1, 2011, plants in habitat and seedlings from habitat seeds; Tom 15-878/1, 1256 m, Tom 15-879/1, 1398 m, February 21, 2015, plants in habitat and seedlings from habitat seeds.

### **DIAGNOSIS**

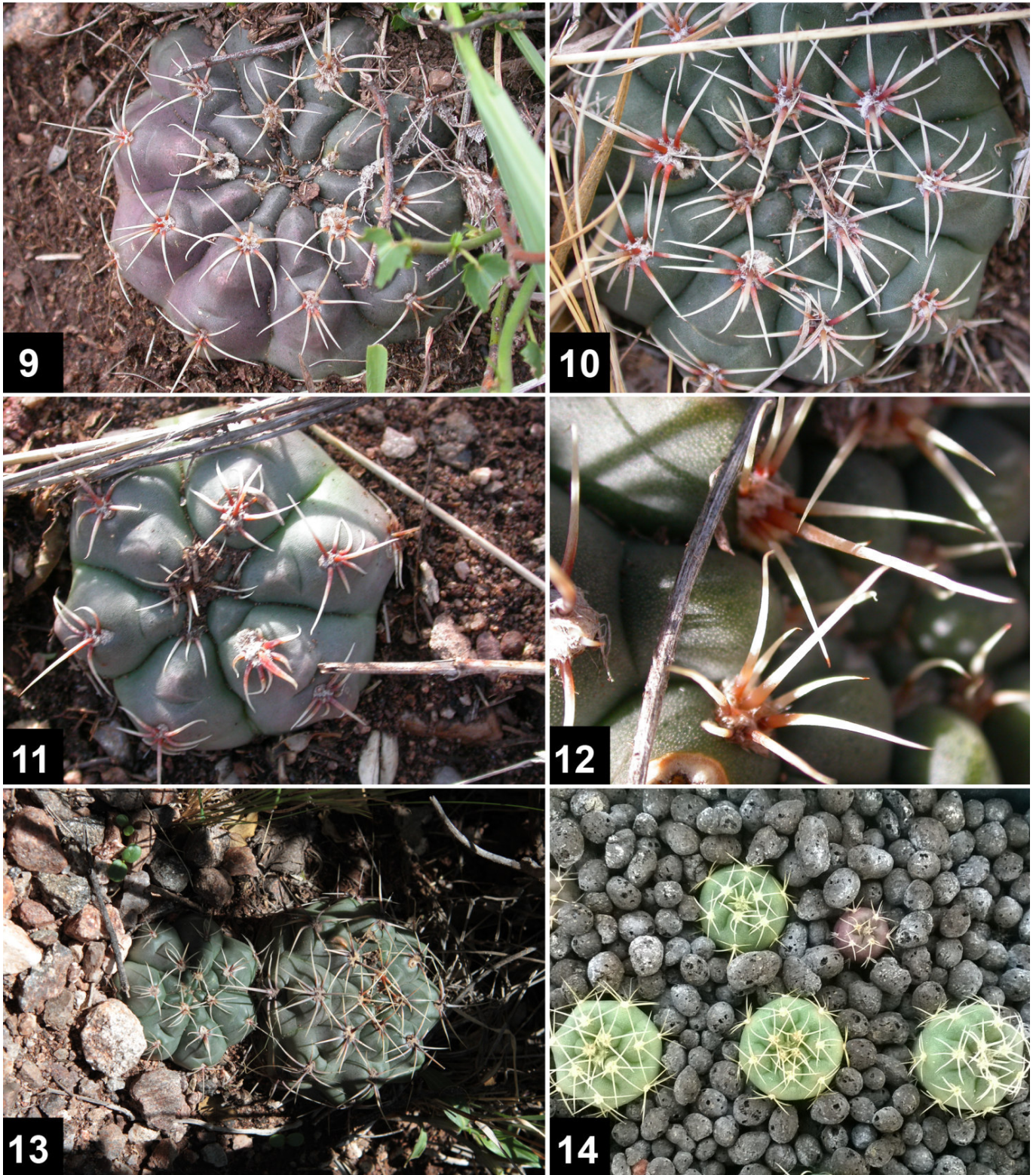
*Gymnocalycium pinali* belongs to the subgenus *Gymnocalycium*. It is characterized by the body of medium size in adult plants, reaching more than 12 cm in diameter and height, globose, light to medium green, almost matt, with 6-8(-10) broad ribs, with horn-coloured spines, darker in the basal half or third, up to 25 mm long, with up to 4 central spines, some flattened near base; flower large, up to 75 mm long, narrowly funnel-form, inner perianth segments white to light cream, throat light pinkish; seed oval, with scattered and irregular cuticle sheath; seedlings with light, uniformly coloured spines.

### **DIFFERENTIAL DIAGNOSIS**

See table 1 for differences with the above cited species. In the surroundings of the type locality *G. erinaceum* is relatively frequent. Adult plants of this species differ in the smaller size, seldom exceeding 5-6 cm, the more numerous ribs, generally always more than 10, thus ribs are also much narrower, the areoles only 5-7 mm distant, the shorter and stiffer spines, light yellowish with reddish base, never flattened at base, the flower smaller, broadly funnel-form, usually with darker reddish throat, the style narrower, the filaments pinkish in the basal part. Seedlings have spines reddish at base. *G. erinaceum* var. *paucisquamosum*, from Ongamira, has a smaller flower, with pinkish perianth segments. Also forms of *G. amerhauseri* are present in the surroundings. Adult plants are smaller, up to 6-7 cm in diameter, often low-globose, spines are shorter and smaller, light grey to whitish, with reddish base, never flattened at base, central spines are generally absent, or seldom there is a single short erect spine, flower is shorter, broadly funnel-form or even sub-campanulate, receptacle is darker red, sometimes magenta red, filaments are pinkish in the basal part, cuticle sheath on seed often forms relatively regular round, well delimited patches; seedlings have spines reddish at base.

Figs 1-8 (next page) Habitat at Los Terrones natural park (1-3). *G. pinali* in habitat. A large plant growing at the base of a shrub (4). The same plant, in detail (5). Another very large plant (6). Adult plants (7-8).





Figs 9-14: *G. pinali* in habitat. Adult plants, showing variation in body colour (9-10). Young plant, with flat central spines in evidence (11). Detail of the areole of a young plant (12). Very small plants, with one central spine already developed (13). *G. pinali*, one-year old seedlings in cultivation (14).

#### DESCRIPTION

**Plant** body low globose in young plants, globose in adult plants, adult plants up to 12 cm in diameter and 15 cm in height; epidermis light to medium green, sometimes with a slight purplish tinge, particularly in plants in more sunny position; root thick, elongate, usually composed of 2-3 major branches; **ribs** 6-8(-10), broad, obtuse, slightly convex, straight, longitudinal furrows

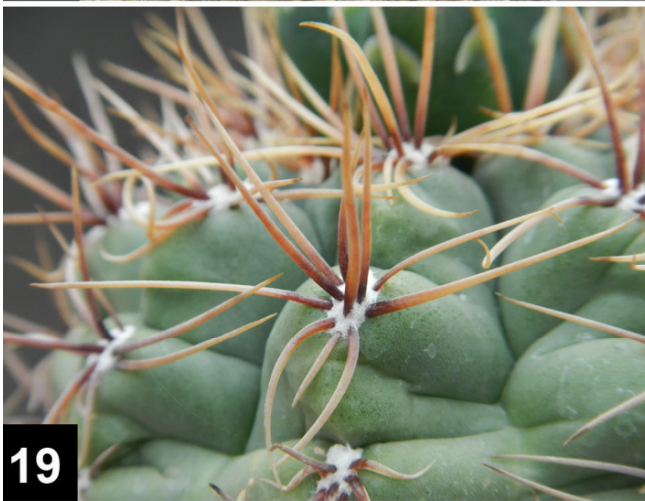
broad and shallow, slightly undulate in upper part of body, straight and almost flattened below; transverse clefts short and sharp, usually limited to the median part of the rib, seldom crossing the entire rib, joining two longitudinal furrows; **tubercles** broad and obtuse, scarcely prominent in fully watered plants, often slightly compressed longitudinally, particularly in young plants, placed below the areoles, just above the transverse cleft, in larger plants more transversely compressed, forming more or less prominent chins. **Areoles** ovate, from 10 to 15 mm distant from each other, with whitish hair, particularly on upper part. **Spines** in adult plants variable in number and shape, also between different areoles of the same plant, spines in upper part of body horn-coloured, with darker basal third, usually more greyish in lower part of body, part of spines in section round, relatively thick, up to almost 1 mm at base in large plants, other spines distinctly flattened, particularly basal; marginal spines 7(-9), from 5 to over 25 mm long, usually 10-15 mm long in younger plants and 20-25 mm long in adult plants, irregularly radially arranged, flexible and slightly twisted, seldom straight, more rigid and more regularly spaced, lower spine 1, usually shorter and sometimes more twisted, often second pair or second and third pairs of lateral spines longer; central spines (0)-1(-2) in young plants, often not from all areoles, adult plants always with several central spines on each areole, up to 4, spines stiff and often more rigid than radial spines, generally more or less distinctly flattened basal, also in young plants, often longer than radial spines. **Flowers** bisexual, robust, large, up to more than 75 mm long and at least 55-60 mm broad at full anthesis; **flower bud** oblong, perianth only slightly broader than pericarpel; at full anthesis perianth and pericarpel not distinctly separated, ratio perianth / pericarpel length 1.3; **pericarpel** glossy green, thick, about 30 mm long, with about 10 light green transverse scales; **perianth** narrow funnel-form, **outer perianth segments** from short spatulate, as long as wide, to oval, progressively longer, up to 35 x 10 mm, greenish on outer side, fading to whitish at margins, whitish on inner side; **inner perianth segments** oblong, 25-30 x 7-10 mm, white or slightly cream coloured; **receptacle** narrow, walls 5 mm thick, green on outer half and light pink on inner half, ovary oblong; **style** light yellowish, very thick, up to 4 mm in section at base, not narrowed distal, about 10 mm long; **stigma lobes** 10-12, as long as base of stigma when closed; **filaments** regularly inserted on the whole receptacle wall, yellow from base, apices of uppermost filaments exceeding the height of the stigma lobes; **anthers** yellow. **Fruit** oblong, 25 x 15 mm, dark green, flower remains persistent. **Seed** sub-spherical, truncate at hilum-micropylar region, with flat, poorly delimited cells, cuticular sheath present, patches rather abundant, moderately thickened, covering usually more than 50% of the testa surface, but absent from several parts; **hilum-micropylar-region** slightly sunken, ovate or more narrowed at the filament insertion. **Seedlings** light green, with 5 to 7 small spines, uniformly yellow to light horn coloured from base.

## PHENOLOGY

*Gymnocalycium pinali* flowers in habitat in October and November, a few weeks before *G. erinaceum*, but at the same time as *G. erinaceum* var. *paucisquamosum*, *G. amerhauseri* var. *altagraciense* and *G. gaponii*. *G. robustum*, *G. campestre* and *G. kuehhasii* set flowers later, in December and January.

Figs 15-24: (next page). *Gymnocalycium pinali* in cultivation. Very large plant, from coll. Ariel Piñal, AP 050, with flowers (15-16) and fruits (17-18). Same plant, details of areoles and spines (19-20). Section of the flower (21-22).





## DISTRIBUTION AND HABITAT

Populations of the new species have been seen only in the northern part of the Sierra Chica, in the area of the park Los Terrones. This unique geological formation of sandstones, igneous rocks and its conglomerates is located in the northern part of La Punilla Valley, 14 km NE of Capilla del Monte. The park is situated in the north-eastern part of the Uritorco pluton and consists of a plutonic – metamorphic basement with Mesozoic continental sedimentary deposits and sediments of Pleistocene, combined with deposition of a tectonic stage from the Pleio-Pleistocene (Massabie 1982, Beltramone 2004). Morpho-structurally belonging to the northern part of the Cerro Uritorco massif, it extends between La Pampilla morpho-structure at south (part of Sierra Chica) and Pajarillo-Copacabana morpho-structure at north (Sierra de Pajarillo) (Beltramone 2004).

The soil consists mainly of tertiary and quaternary sediments, with predominant porphyric granite in a sandy-silty matrix; phenocrystals of microcline give a pink colour with biotite and little muscovite. Sometimes pegmatite segments occur.

The habitat colonized by *G. pinali* is a partially open gentle north-facing slope. Associated vegetation was influenced by alluvial development and structure of alloformation on the north-eastern side of the Uritorco batolite and Los Terrones fault. *Flourensia oolepis* (Asteraceae) and *Baccharis* spp. (Asteraceae) are the most common shrubs, with a scattered presence of *Acacia caven* (Fabaceae), *Aloysia gratissima* (Verbenaceae) and other species. In dense low clumps grow various grasses, such as *Stipa* spp. (Poaceae), with *Dyckia floribunda* (Bromeliaceae) and *Dichondra* cf. *sericea* (Convolvulaceae). Sympatric with the new species, but very scarce, plants of *Gymnocalycium mostii* s.l. were seen.

At higher altitudes the vegetation shifts to mountain pastures with grasses and a few individuals of *Baccharis*.

The majority of the plants of *G. pinali* grow in the shadow of these grasses and shrubs.

## ETYMOLOGY

The new species is named after its discoverer, our friend Ariel Piñal (San Miguel, Buenos Aires, Argentina), an enthusiastic Argentinean explorer of *Gymnocalycium*s in their natural habitats.

## CONSERVATION

The range of the new species, according to the current knowledge, is very small, limited to the slopes directly below and inside the natural park Los Terrones, at 1250-1400 m a.s.l. Even though the nearest surrounding habitats were never explored, *G. pinali* was not found in other known areas of the northern parts of the Sierra Chica, where other species are frequent, such as *G. erinaceum paucisquamosum* and *G. amerhauseri*. According to the IUCN classification, the new species should be classified as **VULNERABLE**, based on the following criteria: D1, D2 [D1. Population size estimated to number fewer than 1000 mature individuals. D2. Population with a very restricted area of occupancy (typically less than 20 km<sup>2</sup>)].

## ACKNOWLEDGEMENTS

We want to thank our friends Ariel Piñal and Eduardo Antonio Sande for having given us all information about the new species, and specimens for their study.

Table 1. Differential characters among *G. pinali* and other species.

species character	<i>G. pinali</i>	<i>G. amerhauseri</i>	<i>G. erinaceum</i>	<i>G. erinaceum</i> var. <i>paucisquamosum</i>	<i>G. gaпонii</i>	<i>G. robustum</i>	<i>G. kuehhasii</i>	<i>G. campestre</i>
<b>Body colour</b>	light to medium, almost matt green, to greyish-green	glossy medium to dark green	glossy medium to dark green	medium to dark green	matt, green to light olive green	matt light greyish-bluish green, dense wax on body	medium green, not very glossy	greyish green, scarcely glossy, often with a brownish flush
<b>Size and shape</b>	more than 12 cm in old plants, globose to high globose	up to 6 cm, flat globose to globose	up to 5.5 cm, globose to slightly elongate	up to 6 cm, globose	Up to 85 mm, sub-globose, often inverted conical	up to 11 cm, flat globose to globose	up to 9 cm, globose	up to 7 cm, low globose
<b>Number of ribs</b>	6-8 (10)	8-10	12-14	7-9	8-9 (11)	9-11	10-12	8-12
<b>Distance between areoles</b>	10-14 mm	10-12 mm	7-8 mm	8-11 mm	11 mm	10 mm	9-10 mm	6-12 mm
<b>Tubercles below areoles</b>	low, rounded scarcely prominent to prominent in old plants	moderately prominent, rounded	small and flat to moderately prominent	rounded, very scarcely distinct	moderately prominent, rounded	prominent, occasionally chin-like triangular, flattened	often flattened and prominent, more or less triangular	distinct, more or less rounded.
<b>Lateral spines</b>	7, 3 pairs radially disposed, not parallel, 1 directed downwards	5-7, radial with 1 directed downwards	7-9 (11), lateral spines sub-parallel, often 1 lateral curved downwards	7-9, lateral spines not parallel	5-7, more or less radially disposed	5-7, curved towards body	3-7, straight to curved towards body	5-9, straight to curved towards body

species character	<i>G. pinali</i>	<i>G. amerhauseri</i>	<i>G. erinaceum</i>	<i>G. erinaceum</i> var. <i>paucisquamosum</i>	<i>G. gaponii</i>	<i>G. robustum</i>	<i>G. kuehhasii</i>	<i>G. campestre</i>
<b>Central spines</b>	(0)-1(-2) in young plants, up to 4 in large plants	0, seldom 1	1-2	1	0-1	0	0	0 (1)
<b>Spine length and disposition - shape</b>	8 to 20 mm, up to 25 mm long in adult plants, flexible to relatively rigid, appressed to body, centrals longer, rigid, round or flat in cross section	6-14 mm, straight to slightly curved, appressed to body, relatively rigid, round in cross section	5-7 mm, straight, thin, rigid, round in cross section	5-10 mm, central to 15, flexible, central spine more rigid	13-16 mm, rigid, straight or slightly curved, appressed to body	6-9 mm, curved against body, usually slightly rigid, oval in cross section	7-10 mm, straight, rigid, stiff, not appressed to body	4-10 mm, straight to curved against body, round in cross section
<b>Colour of spines</b>	horn coloured, darker at basal third to basal half, seldom lighter or grey	light grey or yellowish to whitish, reddish at basal fourth or less	light yellowish, red at basal third to basal half	light yellowish or whitish, red at basal third	Dirty white, at base clearly brown	greyish to dark yellowish, brownish near base	dark yellowish, reddish near base	light yellowish, reddish at basal third
<b>Diameter of spines at base</b>	0.4-0.7, up to 1 mm in adult plants	0.3-0.4 mm	0.2-0.3 mm	0.3-0.4 mm	0,5-0,6 mm	0.4-0.6 mm	0.4-0.7 mm	0.2-0.4 mm

species character	<i>G. pinali</i>	<i>G. amerhauseri</i>	<i>G. erinaceum</i>	<i>G. erinaceum</i> var. <i>paucisquamosum</i>	<i>G. gaponii</i>	<i>G. robustum</i>	<i>G. kuehhasii</i>	<i>G. campestre</i>
<b>Flower length</b>	55-75 mm	35-45 mm	45-55 mm	35-50 mm	57-64 mm	40-65 mm	65-70 mm	40-65 mm
<b>Perianth shape</b>	narrow funnel-form	broad funnel-form to campanulate	broad funnel-form	broad funnel-form to campanulate	narrow funnel-form	funnel-form	broad funnel-form to campanulate	broad funnel-form to campanulate
<b>Inner perianth segments size, shape and colour</b>	30-35 x 15-20 mm, spatulate, white to light cream	20-25 x 10-12 mm, ovate, white	20-25 mm x 8-10 mm, lanceolate, whitish	18-30 x 7-8 mm, light pink	22,5-29 x 6-8 mm, white-light pink, base pink	24-30 x 8-10 mm, white, pink at base, lanceolate	18-22 X 5-7 mm, light cream	24-30 x 5-8 mm, white
<b>Receptacle colour</b>	light pink	light pink to pink	light pink to violet	light carmine	Light pink to pink	pink to reddish	pale pink to pink	pink to reddish-violet
<b>Filament colour</b>	yellow	greenish-white	yellow with pinkish base	pale yellowish	white-light rosa	white	pale yellowish	whitish, pale yellowish
<b>Style length, colour</b>	10 mm long, 4 mm wide	15-16 mm, white	17 mm, white	16 mm, white	12-13 mm, pale green	13 mm, white	11 mm, pale green	11-15 mm, whitish-yellowish, greenish, rose or pale purple basally
<b>Pericarpel height and colour</b>	30 mm, green	19 mm, green	13 mm, dark green, bluish bloom	12 mm, grass-green	15-21 mm, light grey-green	22-30 mm, dark green-greyish green, greyish-pruinose bloom	22 mm, dark green, slightly with greyish bloom	15-24, dark green-greyish green, pruinose bloom

species character	<i>G. pinali</i>	<i>G. amerhauseri</i>	<i>G. erinaceum</i>	<i>G. erinaceum</i> var. <i>paucisquamosum</i>	<i>G. gaponii</i>	<i>G. robustum</i>	<i>G. kuehhasii</i>	<i>G. campestre</i>
<b>Fruit size, shape and colour</b>	25 x 15 mm, oblong moderately glossy green	32-33 x 19 mm, long ovate-fusiform, green	16 x 13 mm, conical, bluish to greenish	15 x 5 mm, fusiform, dark green	16,5-22 x 8-13 mm, ovate-clavate, dark green-olive green	40-45 x 15-18 mm, clavate, rarely fusiform greyish green with pruinose wax	23 x 12 mm, elipsoidal to fusiform, matt green	21-36 x 10-18, oblong-fusiform, dark green to greyish green with pruinose wax
<b>seeds</b>	1-1.3 mm	1.1 x 1.2 mm	1.3 x 1 mm	1.5 x 1.2 mm	1.1-1.3 x 1.2-mm	1,2 x 1,2 mm	1,15-1,2 x 1,1 mm	1,1-1,3 x 1-1,3

## REFERENCES

- Beltramone C.A. 2004. Caracterización morfoestructural del piedemonte occidental de las sierras Chica y de Pajarillo–Copacabana entre La Cumbre y Las Lajas, provincia de Córdoba. *Revista de la Asociación Geológica Argentina*, 59(3): 423–432.
- Massabie A. 1982. Geología de los alrededores de Capilla del Monte y San Marcos, Provincia de Córdoba. *Revista de la Asociación Geológica Argentina*, 37(2): 153–173.

## New finds on the distribution area of *Gymnocalycium prochazkianum* Šorma

**Mario Wick**

Fichtenweg 43, 14547 Fichtenwalde (Germany)

E-mail: [mario.wick@schuetziana.org](mailto:mario.wick@schuetziana.org)



### ABSTRACT

In 1995 Jaroslav Prochazka found a new *Gymnocalycium* species southeast of Quilino in the Argentinean province of Córdoba. This species was described as *Gymnocalycium prochazkianum* in his honour by Vladimir Šorma in 1999. For many years the type locality of this species remained its only known site. In 2013 the author could, together with his travel companions, expand the distribution area considerably in a northern, eastern and southern direction and thus gain new knowledge as to variability of the species and its relationship with the nearby growing taxon *G. simplex* n.n.

### Keywords

*Gymnocalycium*, *Gymnocalycium prochazkianum*, *Gymnocalycium prochazkianum* subspec. simile, *Gymnocalycium prochazkianum* subspec. simplex, *Gymnocalycium simplex*, *Gymnocalycium robustum*.

### INTRODUCTION

In 2005 I went on my first journey to Argentina with my friend Volker Schädlich, who is travel-experienced in *Gymnocalycium* matters. Among other things we had planned a visit to the type locality of *Gymnocalycium prochazkianum* Šorma near the village Quilino in the province of Córdoba. It took two more journeys to finally be able to see the desired plants with my own eyes and to get an overview of the species.

### DISCUSSION

In 1995 Jaroslav Prochazka visited the area around the small village Quilino, province of Córdoba in Argentina, together with his travel companions Wolfgang Papsch, the latter's wife and Thomas Prasch. There he found beautiful plants, which were described as *Gymnocalycium prochazkianum* in the honour of Jaroslav Prochazka (Šorma 1999).

As we refer to the plants' features at their type locality in the following, the first description published in *Gymnofil* is repeated here.

***Gymnocalycium prochazkianum* Šorma, spec. nov.**

**Body** solitary, flat to hemispherical, 40-70 mm in diameter, epidermis dark grey, matt. Apex slightly sunken, covered with spines. **Ribs** 7-9, straight, divided into tetragonal protuberances of 10 x 15 mm by transversal grooves. **Areoles** round, in the beginning with dirty-white downy wool. Spines always three, up to 1 cm long, of the same length, two lateral spines and one directed downward, tight to the body, straight to slightly bent, greyish white, pungent. **Flowers** originate close to the apex, funnel-shaped, 60 mm long and 50 mm wide, the outer lanceolate petals are pinkish white with a darker medial strip, inner petals white, the middle of the flower (throat) is dark pink. The flower tube is short and covered with some scales. **Fruit** oblong, grey, 15 mm long and 7 mm wide. **Seed** small (tiny) blackish, matt, about 0.8 mm long and 0.5 mm wide, hilum not pronounced, Subgenus *Microsemineum* Schütz.

**Type locality:** Argentina, Province of Córdoba, on a low ridge south of Quilino.

**Holotype:** JPR 95-184/562A, 17.11.1995 (deposited in WU). Further material investigated: VS 141/1997.

In the following the localities are presented.

**Assumed type locality of *G. prochazkianum***

On leaving the town Deán Funes in a north-western direction, flat-topped hills appear to the right of the road after about 25 km. Judging from its first description we assumed that this was where the locality of *G. prochazkianum* could be found (see first description). This flat range of hills stretches for about 10 km in north-eastern direction beyond Villa Quilino. Near Villa Quilino the hills become slightly steeper and rockier and are divided by a valley. In the north, getting flatter and flatter, the range of hills slopes down, ending approximately at El Puesto (Map 1).



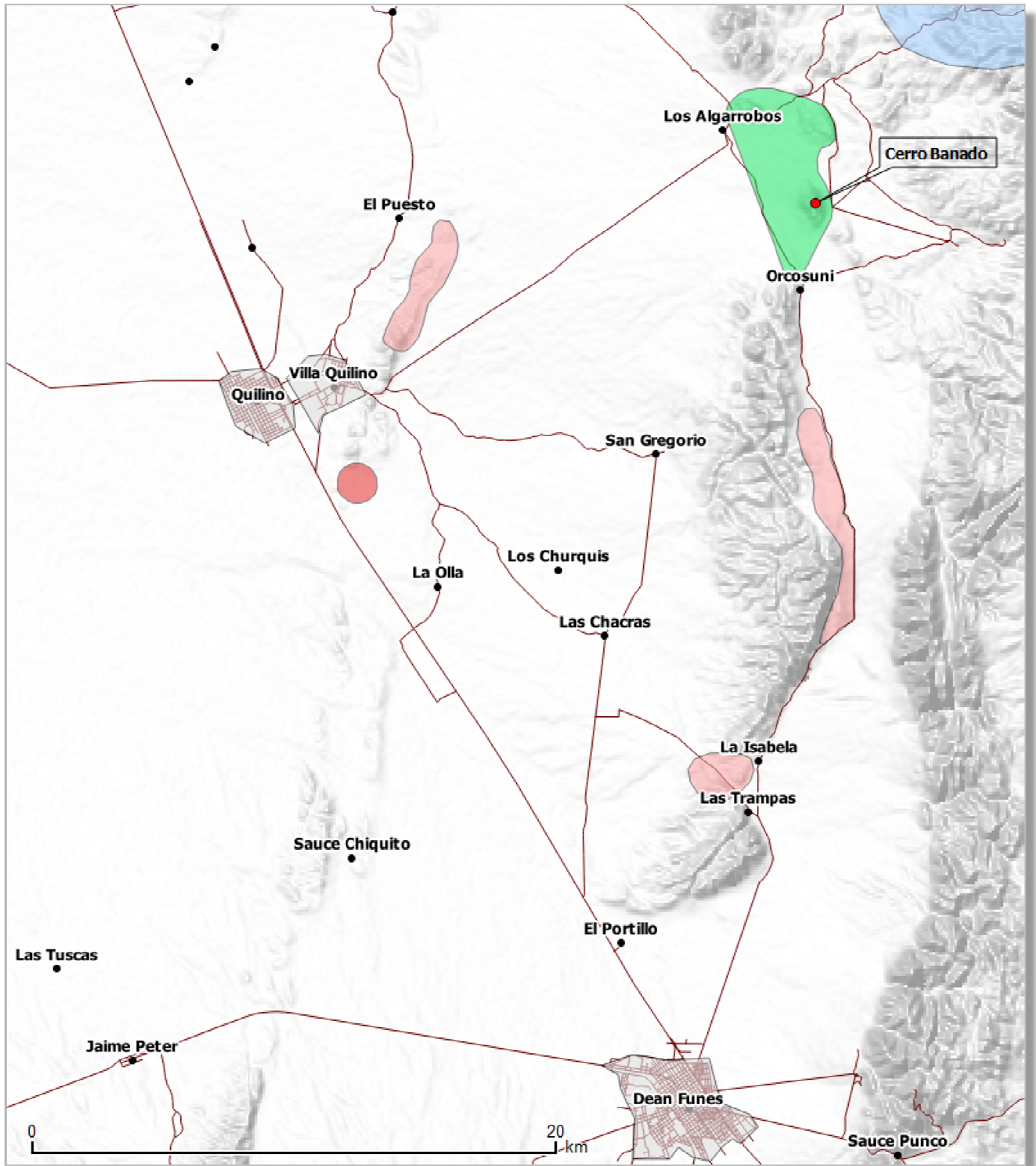
Fig 1: Assumed type locality of *G. prochazkianum* few km south of Quilino

On the morning of October 31<sup>st</sup> we searched for a long time, however, we couldn't find any further *Gymnocalycium* species apart from *G. stellatum* Spegazzini (Fig 2) in its typical locality in cracks in solid rock and only occasionally *G. schickendantzii* (F. A. C. Weber) Britton & Rose (Fig 3) under shrubs on the sandy plain.

Only on our way back to the car, when searching on the right side of the grass tufts and with light from behind, could we discover *G. robustum* R. Kiesling et al., which had not been possible to discern in the oncoming light of our outward trip. We had relocated the type locality of *G. robustum*. There were numerous plants, which were in very good condition. Unfortunately seeds could not be found. *G. prochazkianum* does not grow on this hill.

On the occasion of our second visit in 2010 the appearance of the area had changed completely. Then a lot of shrubs grew there and the number of *G. robustum* had declined dramatically.





Map 1: Distribution area of *G. prochazkianum* according to present knowledge

**red:** Type locality of *G. prochazkianum*; **light red:** new localities of *G. prochazkianum*; **green:** Sites Orcosuni, Cerro Bañado and Los Algarrobos; **light blue:** Start of distribution area of *G. simplex*

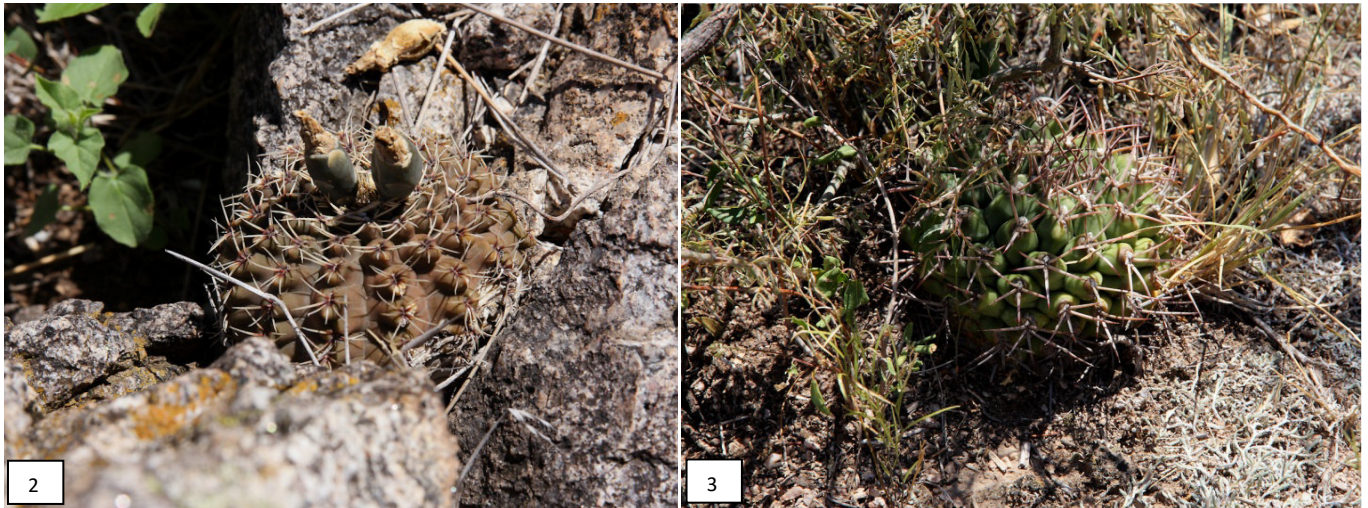


Fig 2: *G. stellatum*; Fig 3: *G. schickendantzii*, southeast of Quilino

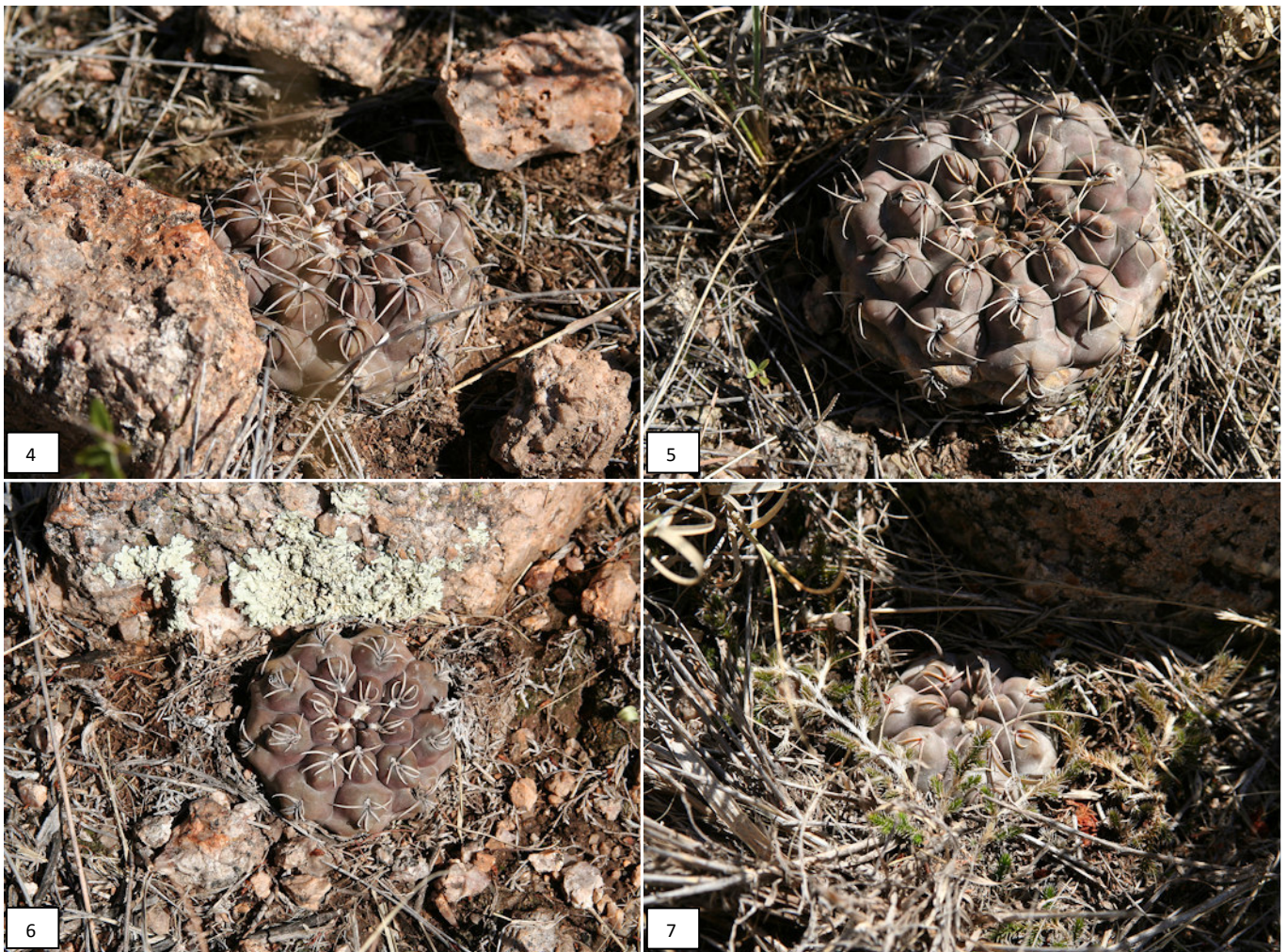


Fig 4-7: *G. robustum* southeast of Quilino

### Type locality of *Gymnocalycium prochazkianum*

It took a hint from our friend Jaroslav Prochazka to find the type locality of *G. prochazkianum*. To this end we, me, Volker Schädlich, Thomas Strub and Reiner Sperling had to do some walking. Jaroslav had described the locality as “with lots of extremely beautiful plants”. Sadly, not much of this remained. There were only few plants and most of them in bad condition.

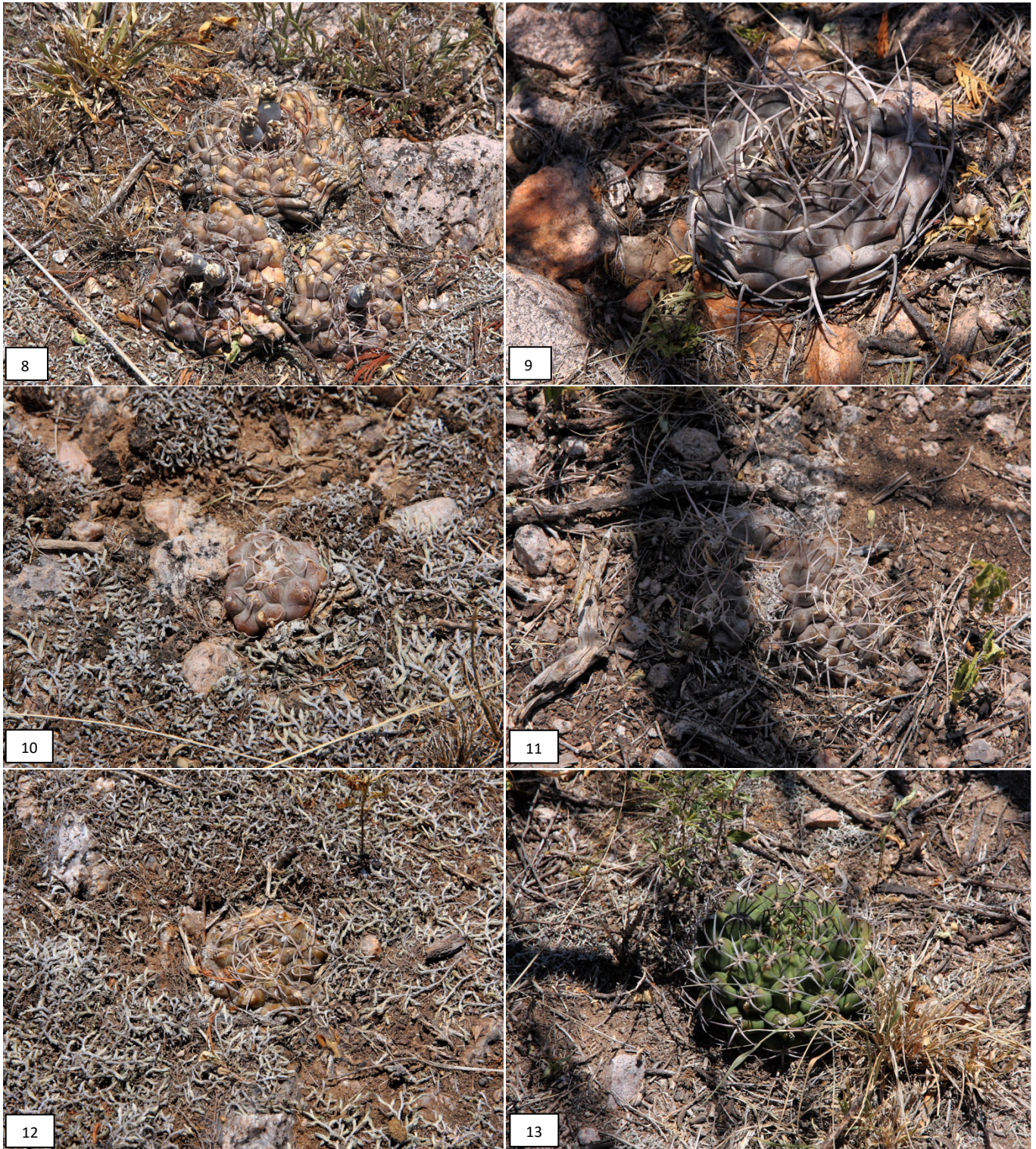


Fig 8-12: *G. prochazkianum* at its type locality, Fig 13: *G. schickendantzii* southeast of Quilino

The largest solitary specimen was about 12 cm in diameter (Fig 8). The number of spines regularly amounted to the 3 radial spines in T-position specified in the first description (Fig 8-12). However, they were occasionally considerably longer than the specified 1 cm (Fig 9, 11). On one of the two larger specimens 4 spines occurred sporadically in just a few areoles (Fig 9). In the first description the number of ribs is established as 7-9. This obviously only applies to young plants, as we found up to 12 ribs. Severe drought had caused a drastic reduction in the number of plants, these plants were in very bad condition. Accompanying plants were on the plain *G. schickendantzii* (Fig 13) and on the lower part of the hill *G. robustum* (Fig 14-15).



Fig 14-15: *G. robustum* at the type locality of *G. prochazkianum* southeast of Quilino

### Locality near El Puesto

Up to our joint journey in 2013, the type locality of *G. prochazkianum* was the only site known for this beautiful species.

Thanks to satellite pictures of Google Earth we could discern an extension of the type locality's hills during the preparation for our journey. It begins southwest of Quilino and stretches for some kilometres northeast of Villa Quilino, up to the same latitude as El Puesto (Map 1). At its end the hills rise only a few metres above the surrounding area. A narrow dirt road runs parallel to the hills in the same direction. From there the distance to the hills must be covered on foot.

On the hilltops we found another location of *G. prochazkianum* (Fig 16-17). The plants there were very much exposed to the sun and at the time of our discovery they had taken on a markedly different colour, a reddish to a yellowish hue, also due to the drought. They lacked the grey epidermis established in the first description (Fig 25). The largest plants reached a diameter of about 10 cm and their appearance was in accord with the plants at the type locality. As opposed to this, older plants regularly had 5 (-6) spines of up to about 2 cm length and up to 11 ribs.

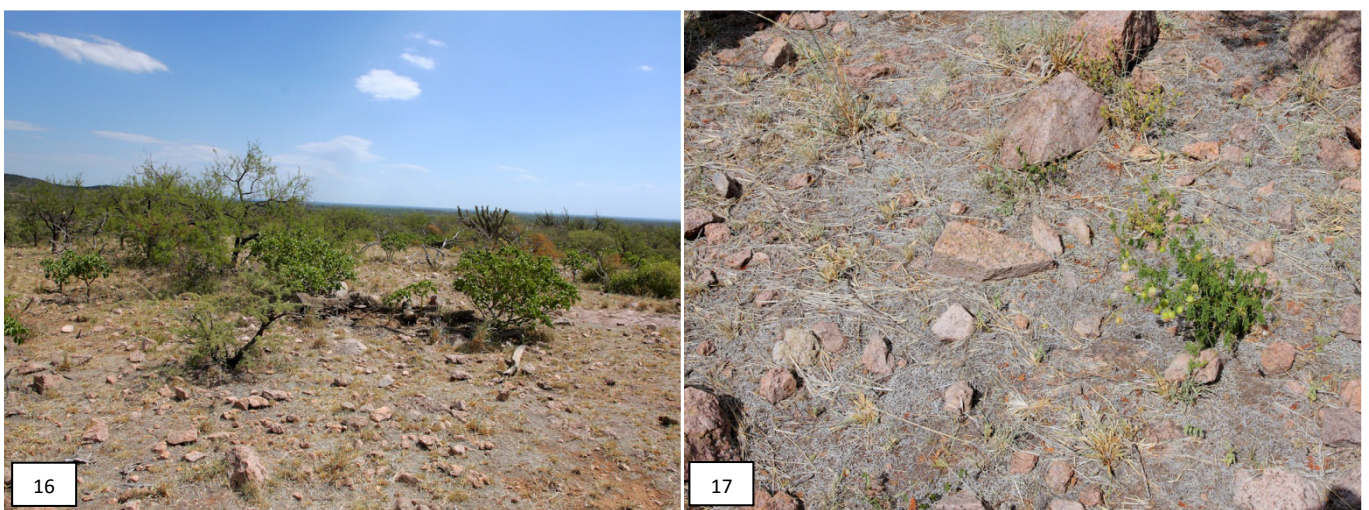


Fig 16-17: Site of *G. prochazkianum* 6 km northeast of Villa Quilino



Fig 18-25: *G. prochazkianum* at its locality 6 km northeast of Villa Quilino

At this locality *G. robustum* and *G. prochazkianum* were found co-existing on the hilltop (Fig 26-29).

The plain surrounding the hill is made up only of sandy material and is not suitable as a site for *G. prochazkianum* and *G. robustum*.

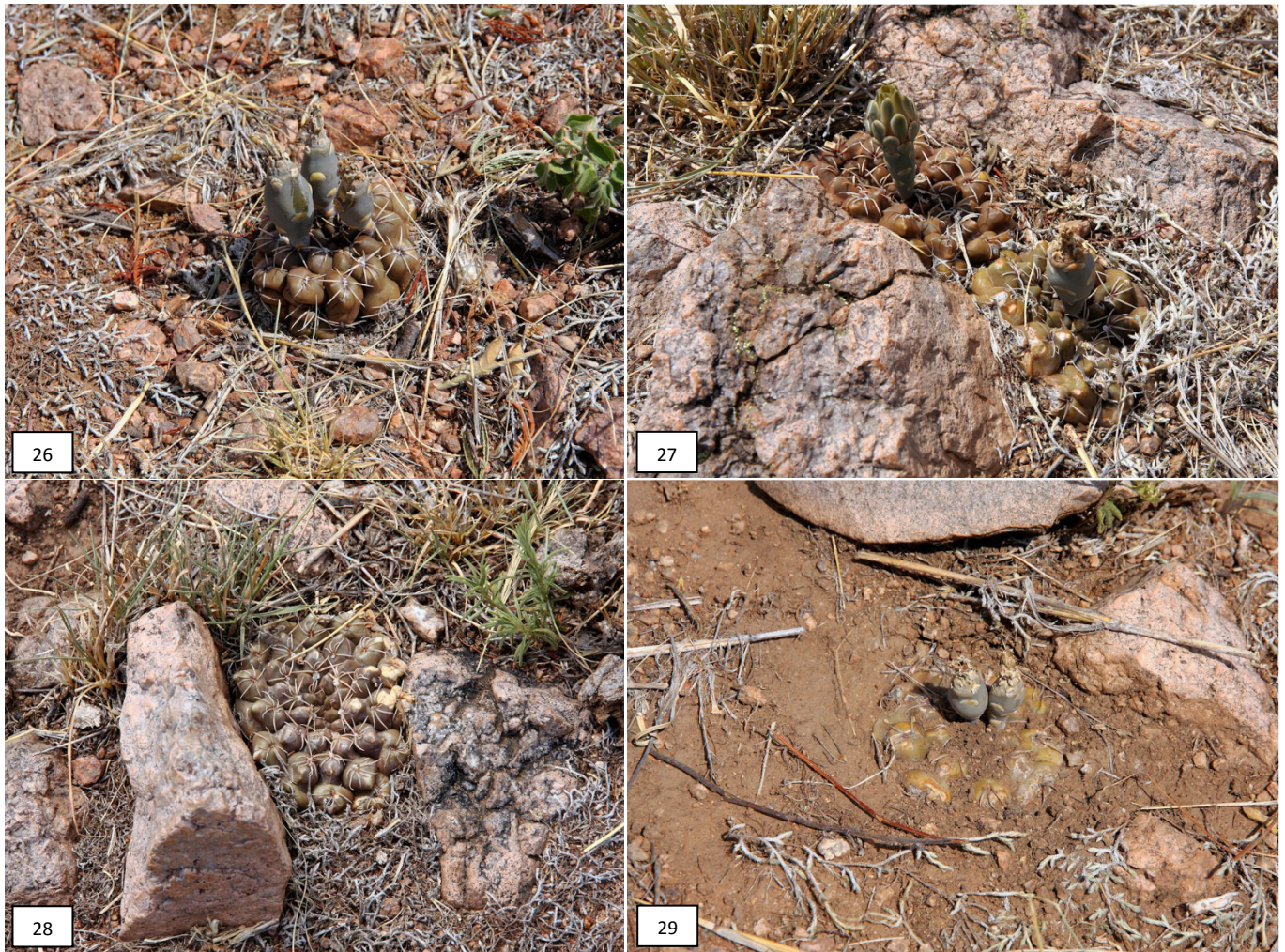


Fig 26-29: *G. robustum*, here co-existing with *G. prochazkianum*, 6 km northeast of Villa Quilino

### Eastern locality (without mentioning nearby colonisation)

On the late afternoon of 27<sup>th</sup> January 2013 we were already on our way back from Orcosuni to the hotel in Deán Funes. The day had been exhausting, but successful and we wanted to get out of the car once more to investigate the rocky plains mainly to the right of the road. We found large numbers of *G. robustum* between the rocks in the middle of the omnipresent *Selaginella*, with lots of ripe fruits (Fig 30-32). Our friend Reiner Sperling was still eager to explore, even at that advanced hour. He went back to the very flat hill situated about 350 m behind us. In the dappled shade of the shrubs he found beautiful specimens of *G. schickendantzii* (Fig 33).



Fig 30-32: *G. robustum*; Fig 33: *G. schickendantzii*, 4 km south of Orcosuni

On the hilltop, however, he discovered a wonderful, totally pristine location of *G. prochazkianum* with plants in very good condition. Judging from the large number of specimens we had the impression that nobody could have been there before (Fig 34-41). As I had also gone in the direction of the hill during my search of *G. robustum* I could hear Reiner's excited exclamations and hurried up the hill. It was an exhilarating sight.

Older specimens, too, were of a diameter of merely 5-7 cm at this locality. On the whole, these plants had shorter spines than those at the so far presented sites, but in appearance they resembled the plants at their type locality and the El Puesto plants. Most of the plants showed 3 spines per areole throughout. Just a few exhibited 5 lateral spines in the areoles (Fig 35, 39). Predominantly young specimens were found on which mature spination had not yet formed. Luckily we could find a few seeds, so that plants could be cultivated. The seedlings, which have grown to a size of about 2.5 cm in the meantime, are not different from the seedlings from the two previously known localities.

*G. robustum*, discovered in large numbers on the plain, was not found by us on the hill, though it was proved to occur there as well by Thomas Strub on a later journey.

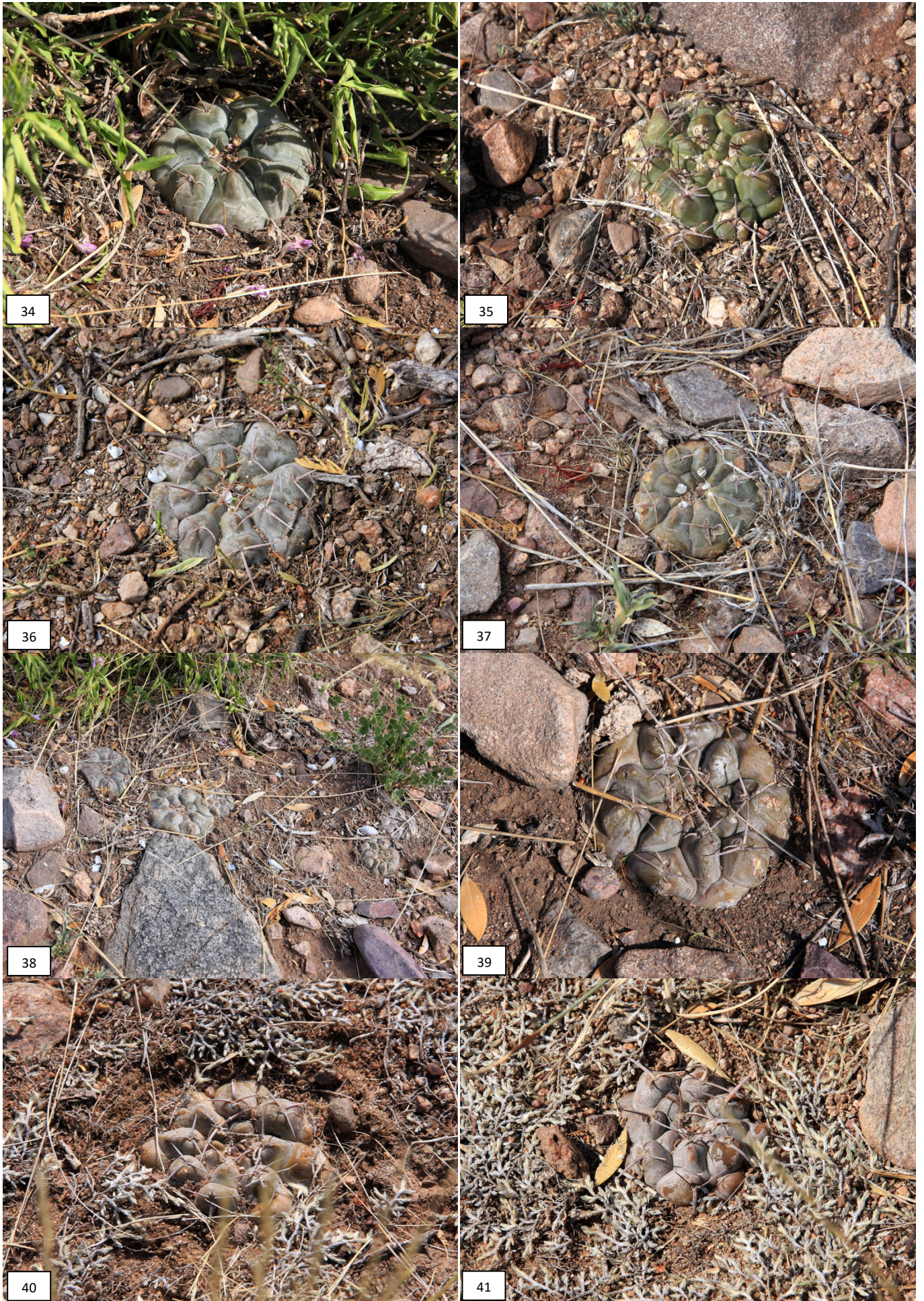


Fig 34-41: *G. prochazkianum*, 4 km south of Orcosuni



## Locality near Las Trampas

On planning our journey in 2013 we looked at Google Earth and came across a small dirt road which turns off into the Campo about 8 km north of Deán Funes. The road was in poor condition and accessible by car only in northern direction via Las Chacras as far as Villa Quilino.

On 28<sup>th</sup> January, 2013, we left Deán Funes early and turned into this road. On our way the vegetation got completely impenetrable on both sides of the road after a few kilometres and we could search only the roadside for cactuses (Fig 42). We found splendidly spined *G. schickendantzii* (Fig 43), *Echinopsis leucantha* (Gillies ex Salm-Dyck) Walpers, *Opuntia spec.* and *Cereus spec.* However, only a few of these areas exist anymore, the larger part of the plain consists of meadows for cattle.



Fig 42: On the way to the site of *G. prochazkianum*; Fig 43: *G. schickendantzii*, 12 km north of Deán Funes

After two more kilometres the road forks off and we turned east. The dirt road curves slightly in a south-eastern direction. After 4 more kilometres gentle hills occur again. We got out of the car and were rewarded once more.



Fig 44: location of *G. prochazkianum* near Las Trampas

Again we found a totally intact, new locality of *G. prochazkianum* with numerous plants, this time also large and obviously old ones as well (Fig 45-54).

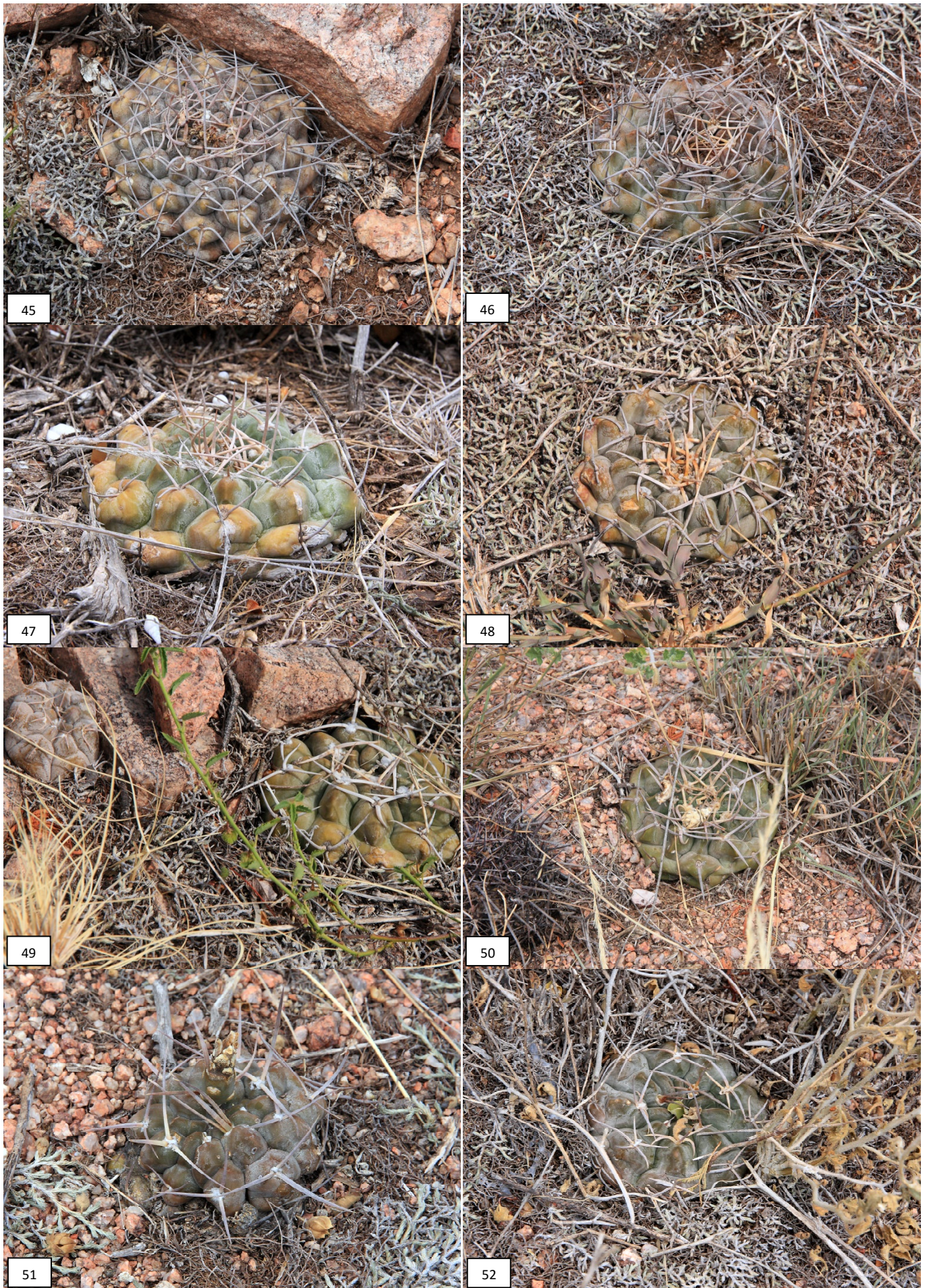


Fig 45-52: *G. prochazkianum* near Las Trampas



Fig 53: *G. prochazkianum* near Las Trampas; Fig 54: detail of the site

Young plants showed the typical 3 spines per areole with a remarkable variation in spine length. The spines were longer than 1 cm as a rule (see first description). Old plants possessed 4-5 lateral spines and sometimes also a central one (Fig 46). The largest plants' bodies had a diameter of 15 cm and up to 13 ribs.

The natural habitats of *G. prochazkianum* are very similar. Obviously they are always formed by gently rounded hills which probably consist of coarse residual soil completely and of which the sub-surface mostly is formed by solid rock. The space between the stones is filled with fine clay-like substrate and residual grit.

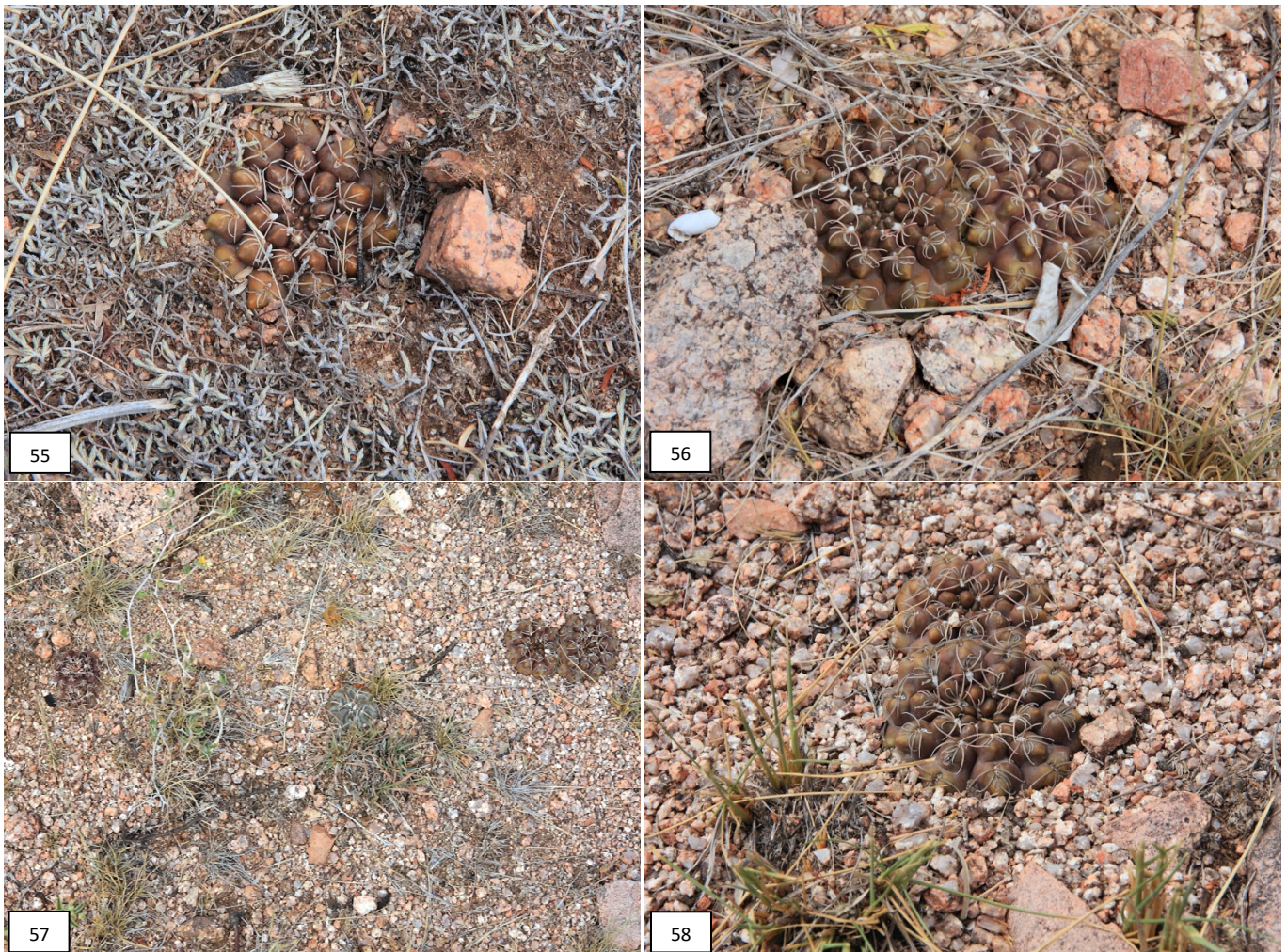


Fig 55-58: *G. robustum*, coexisting with *G. prochazkianum* near Las Trampas

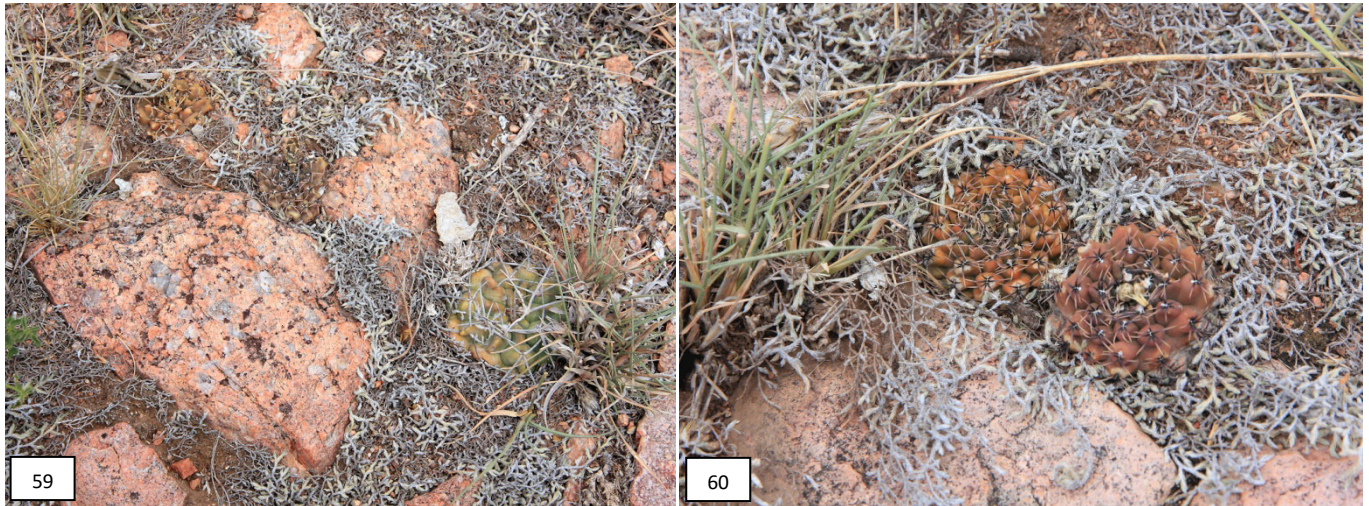


Fig 59-60: *G. stellatum*, coexisting with *G. prochazkianum* near Las Trampas

A small part of this locality consisted of solid rock at the surface. In this area *G. stellatum*, typical of such growth conditions, were growing. In the peripheral zone scattered specimens of *G. prochazkianum* (Fig 59) occurred. *G. robustum* was found distributed over the whole hill.

### Locality near Orcosuni



Fig 61: Site near Orcosuni

On the early afternoon of 31<sup>st</sup> October 2005 Volker Schädlich and I were on our way from Quilino to San Pedro Norte. It had been raining. About 17 km northeast of Villa Quilino the map indicated that we had to turn right. In the middle of the crossroads there was a large, apparently deep lake. Volker swung the car round and we narrowly escaped ending up in the lake. After several kilometres the surrounding landscape seemed unfitting. There should have been hillier ground and the sun did not come from the right direction – we had left the road about 500 m too early. As we had already covered a distance of 5 km on the wrong road and as there was a little hill in front of us we decided to pay it a visit. There is sometimes a blessing in disguise; we discovered a very interesting location with respect to *Gymnocalycium*.

It had been raining early in 2005. Many of the plants found so far had buds, flowers and sometime ripe fruits as well. Near Orcosuni halfway up the hill we discovered beautiful plants with buds and fruits, unfortunately without flowers. As we had not found the type locality of *G. prochazkianum* in 2005 (see above) we did not recognize the plants. Two out of five discovered plants (Fig 62, 65) were flat with a bluish green epidermis covered in a whiff of grey. The remaining three plants had a green body (Fig 63, 64), with the body of the fifth plant being almost round (Fig 66), rising much higher above the ground and having a much higher number of spines as well as a central one. The ribs were almost completely dissolved into tubercles. As

the number five plant even had a somewhat smaller diameter (about 10 cm) than the flat plant of fig 65 (about 12 cm) it seemed to be a second species. Another *Gymnocalycium* found was *G. stellatum* (Fig 67).

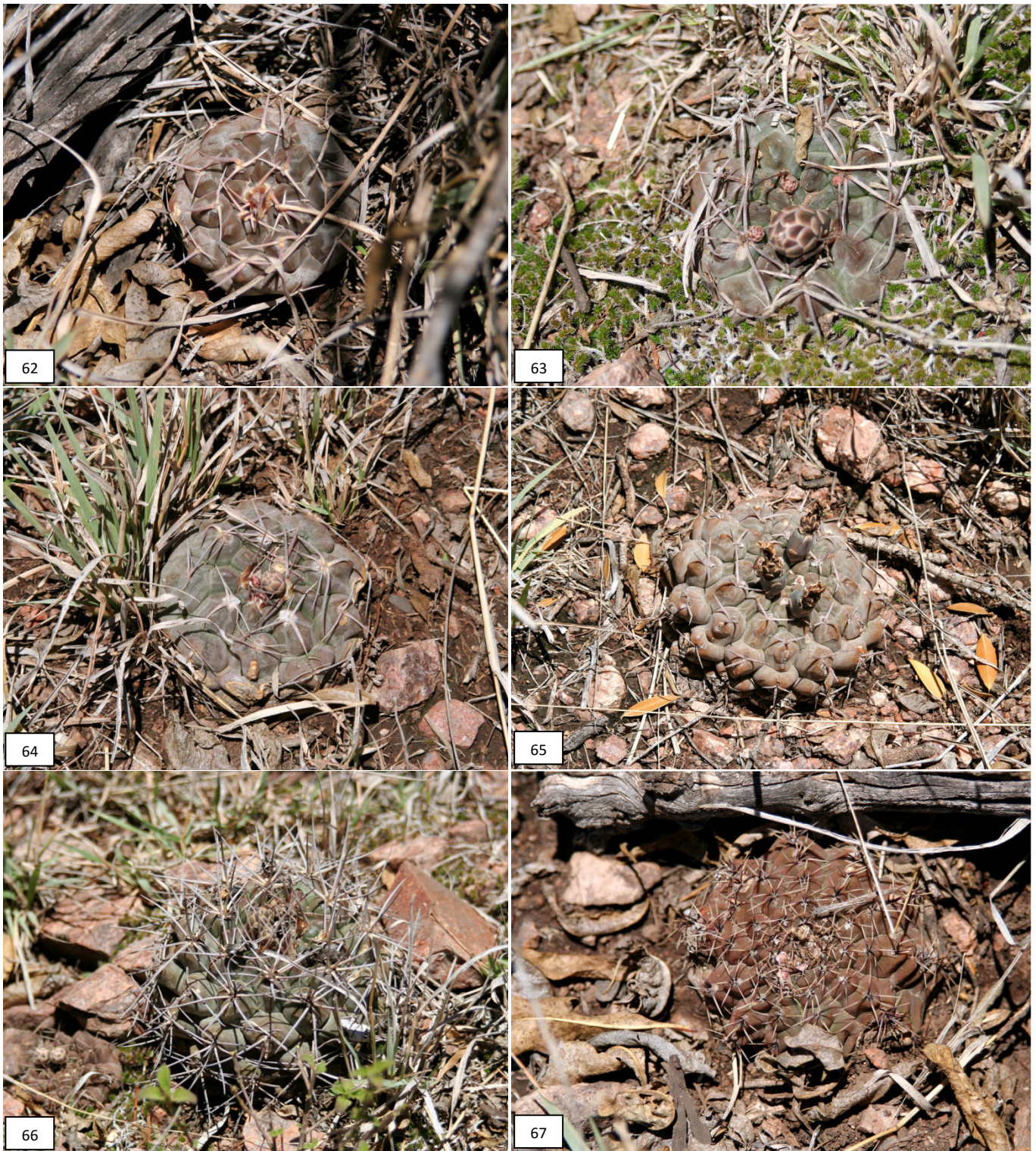


Fig 62-66: *G. prochazkianum x simplex*; Fig 67: *G. stellatum*, site near Orcosuni, visit in 2005

As we could not find any more plants on the slope of the hill and voices and shouts could be heard from the nearby farm (Orcosuni) we left that great locality.

After we had reported on this discovery at home - at our *Gymnocalycium* conference 2006 - many *Gymnocalycium* devotees have visited that locality in the last few years. They have found out that the proper location with numerous plants is situated closer to the ridge of the hill. There

is a wide variety of plants. Many specimens rather resemble *G. prochazkianum* and others *G. simplex*.



Fig 68-69: *G. prochazkianum* x *simplex*, plants more resembling *G. prochazkianum*, location near Orcosuni in 2013

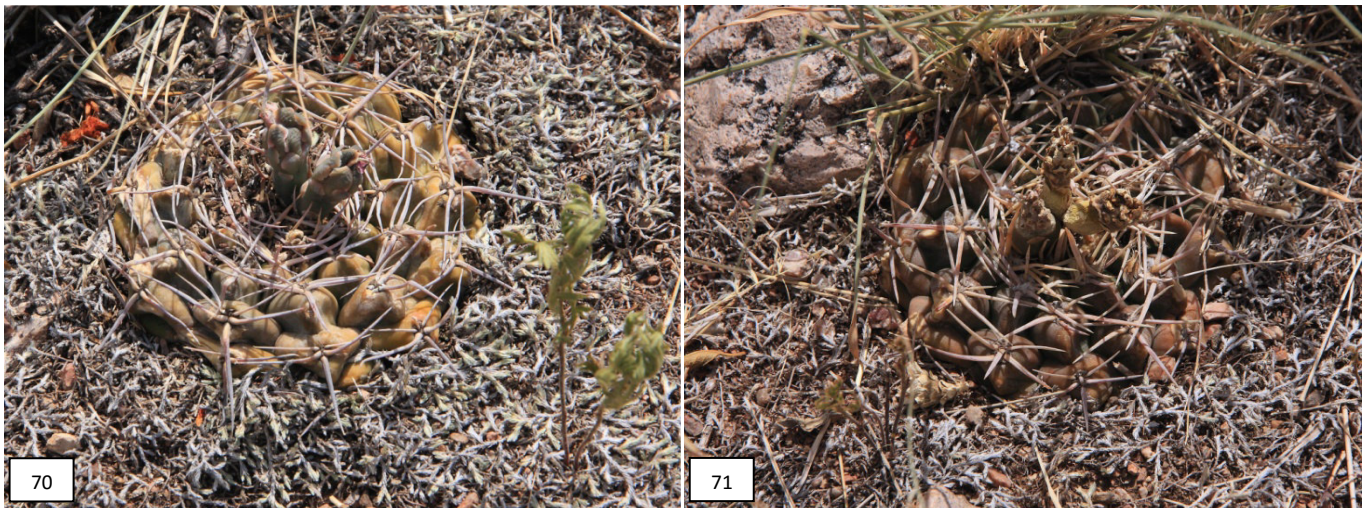


Fig 70-71: *G. prochazkianum* x *simplex*, plants more resembling *G. simplex*, location near Orcosuni in 2013

Spination of the plants from Orcosuni is of the same colour as that of *G. prochazkianum* and is not bicoloured. Young plants have 3-5 lateral spines and sometimes already a central one. Old plants usually have more than 5 spines and sometimes a central spine. With young specimens the number of ribs amounts to 7-9 and with older plants up to 12. The body of the majority of plants is green. The root is not so much beet-shaped as with *G. prochazkianum* and often consists of a few thickened, fusiform roots. Cultivated plants from this location vary in appearance according to the features of the mother plant (Fig 72-75).



Fig 72: *G. prochazkianum* Type locality; Fig 73: *G. simplex* San Pedro Norte; Fig 74-75: *G. prochazkianum* x *simplex* Orcosuni, seedlings from different parental plants: the left plant's body is round with several thickened, succulent roots; the right plant remains flat and has 2 thick, beet-shaped roots

### Locality near Los Algarrobos

The locality near Algarrobos is situated 7 km south of Orcosuni. Here plants with single-coloured spines as well as plants with the typical bicoloured spination of *G. simplex* can be found. The bodies are mostly green, very rarely bluish. Older plants have up to 15 ribs. As opposed to the locality near Orcosuni the plants here are already much more similar to *G. simplex*.



Fig 76-77: *G. prochazkianum* x *simplex* 1.8 km east of Los Algarrobos

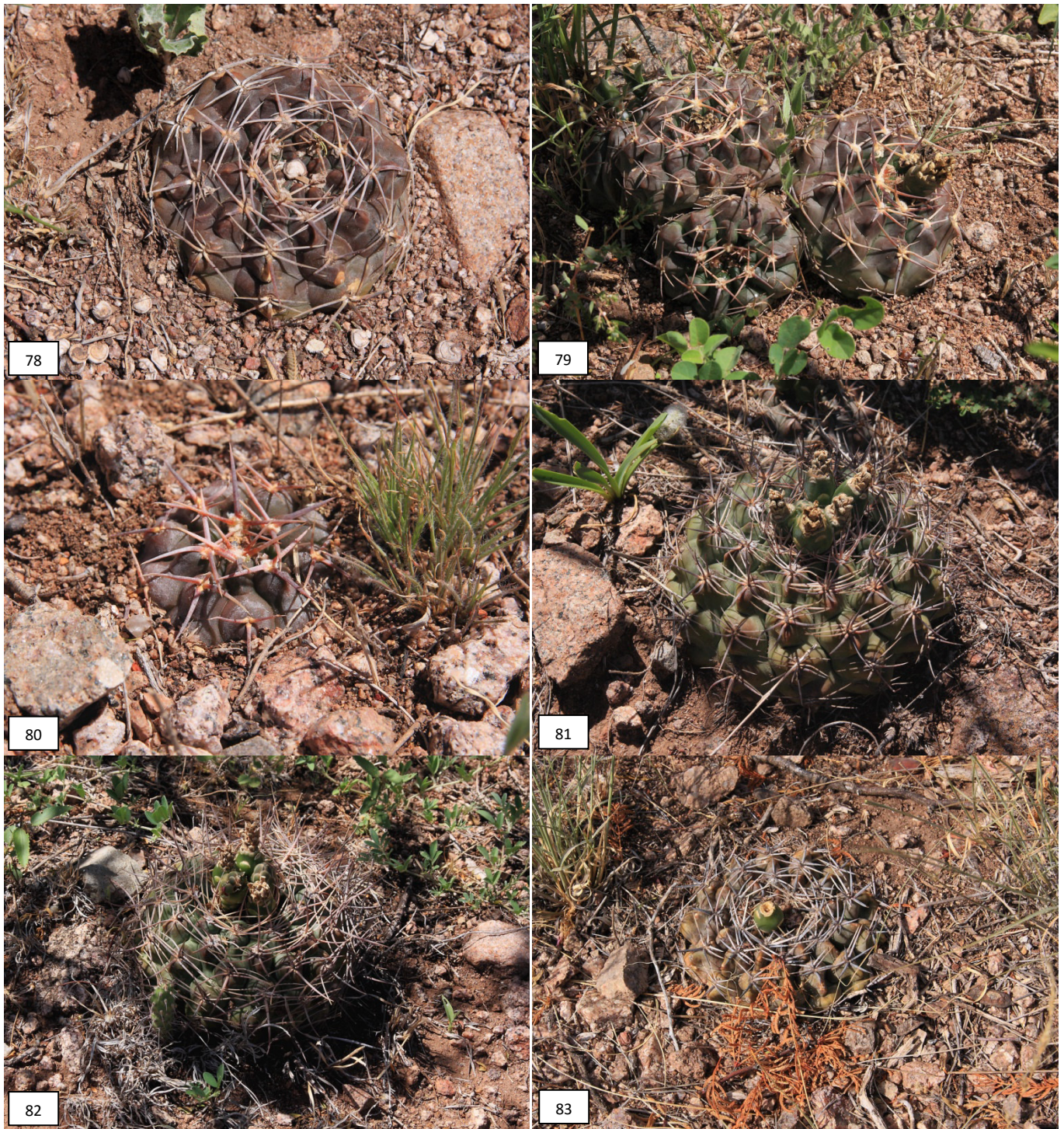


Fig 78-83: *G. prochazkianum* x *simplex* 1.8 km east of Los Algarrobos

A further location with plants very similar to this location is situated 1.2 km further to the east:  
3 km east of Los Algarrobos



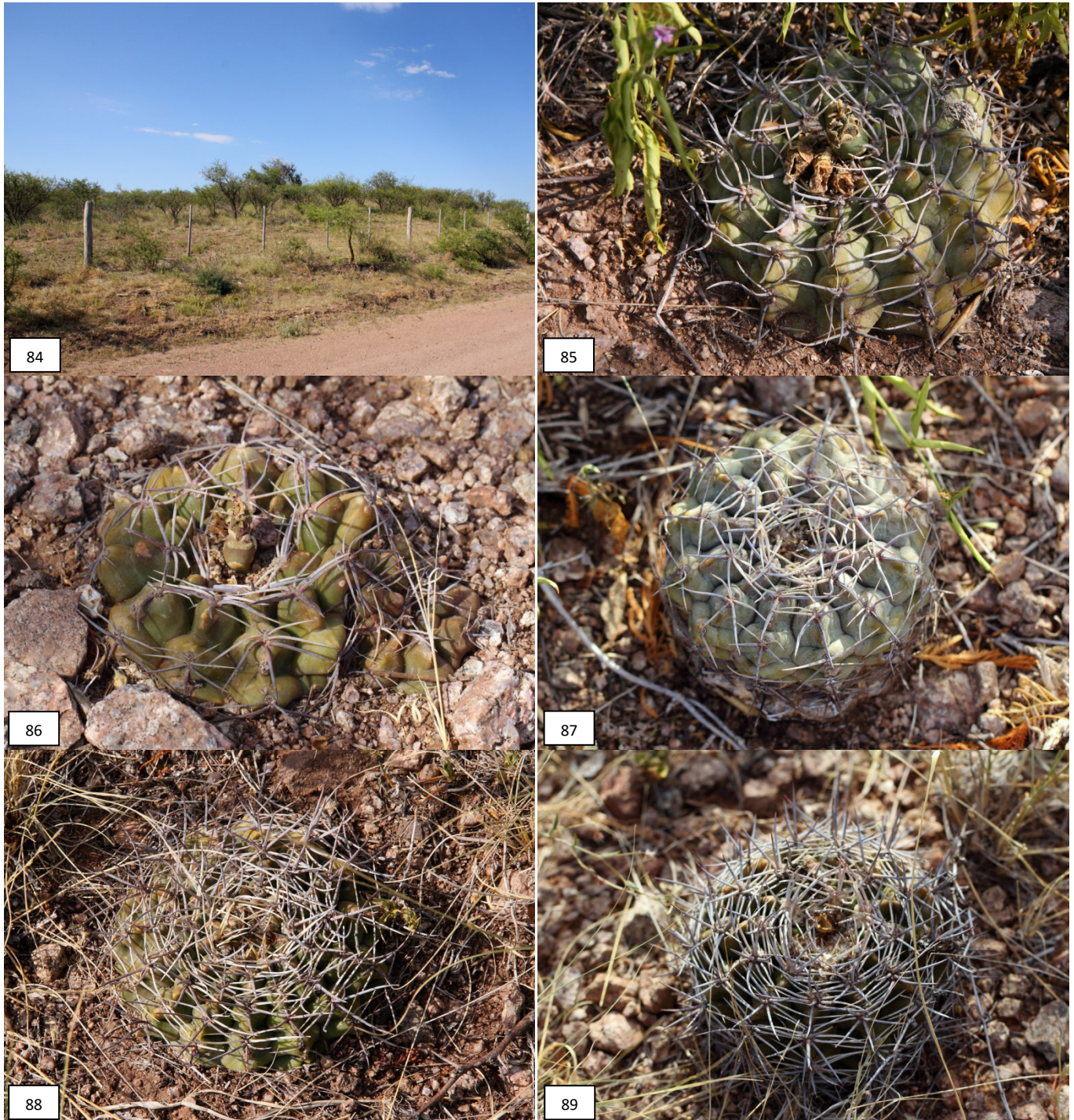
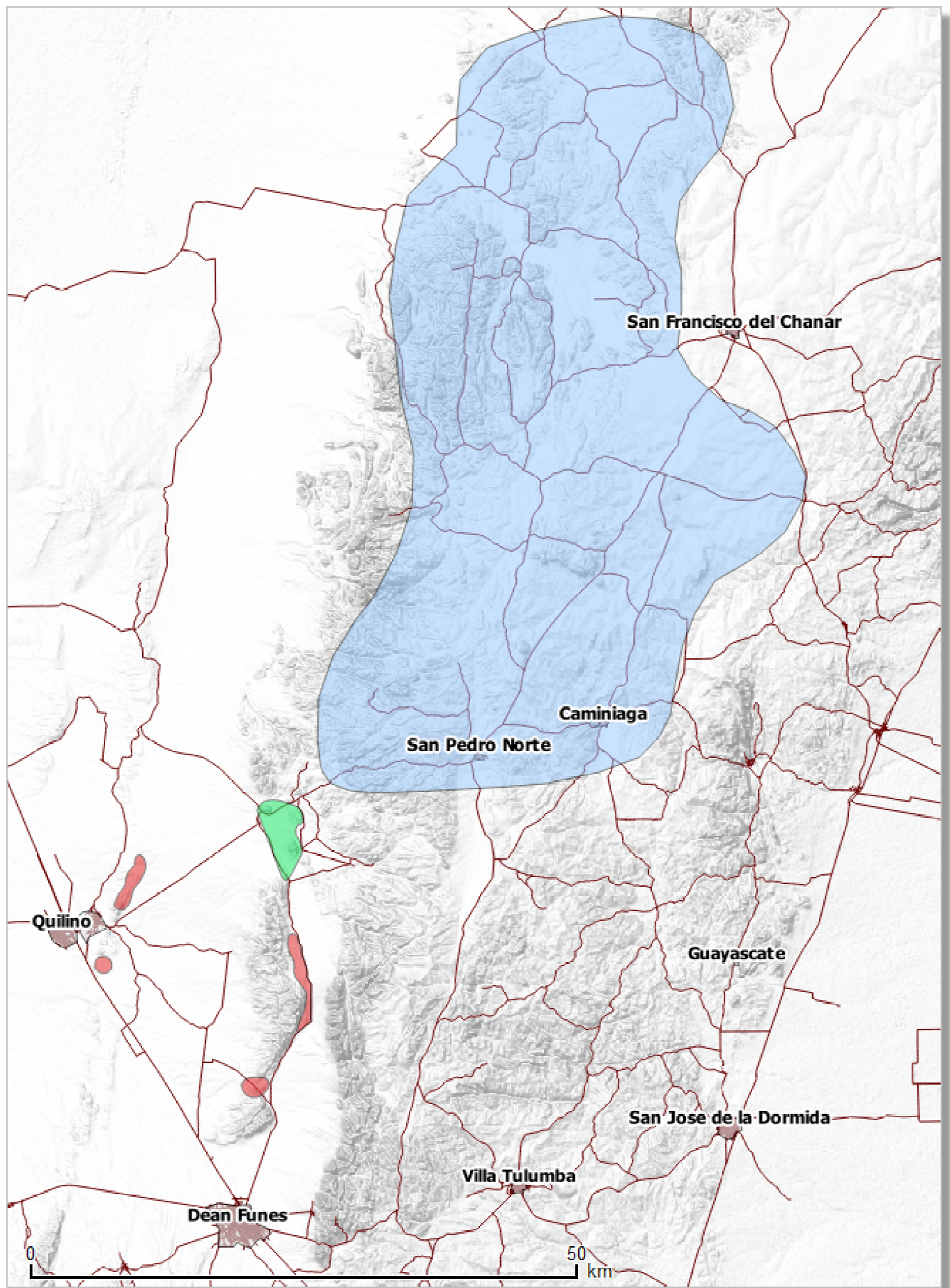


Fig 84-89: *G. prochazkianum* x *simplex* 3 km east of Los Algarrobos

### Distribution area of *Gymnocalycium simplex* n.n.

The distribution area of *Gymnocalycium simplex* begins about 8 km north-east of Los Algarrobos (Map 2, light blue polygon). Starting from this locality, variability of *G. simplex* becomes very slight and no more influence on its appearance by *G. prochazkianum* can be established. All plants have bicoloured spination, a green body, up to 16 ribs and are in accord with the plants from the area 3 km northeast of San Pedro Norte in Figure 90 to 93.



Map 2: distribution area of *G. prochazkianum* and *G. simplex* according to present knowledge  
**red:** localities *G. prochazkianum*; **green:** localities *G. prochazkianum* x *G. simplex*; **light blue:** distribution area *G. simplex*

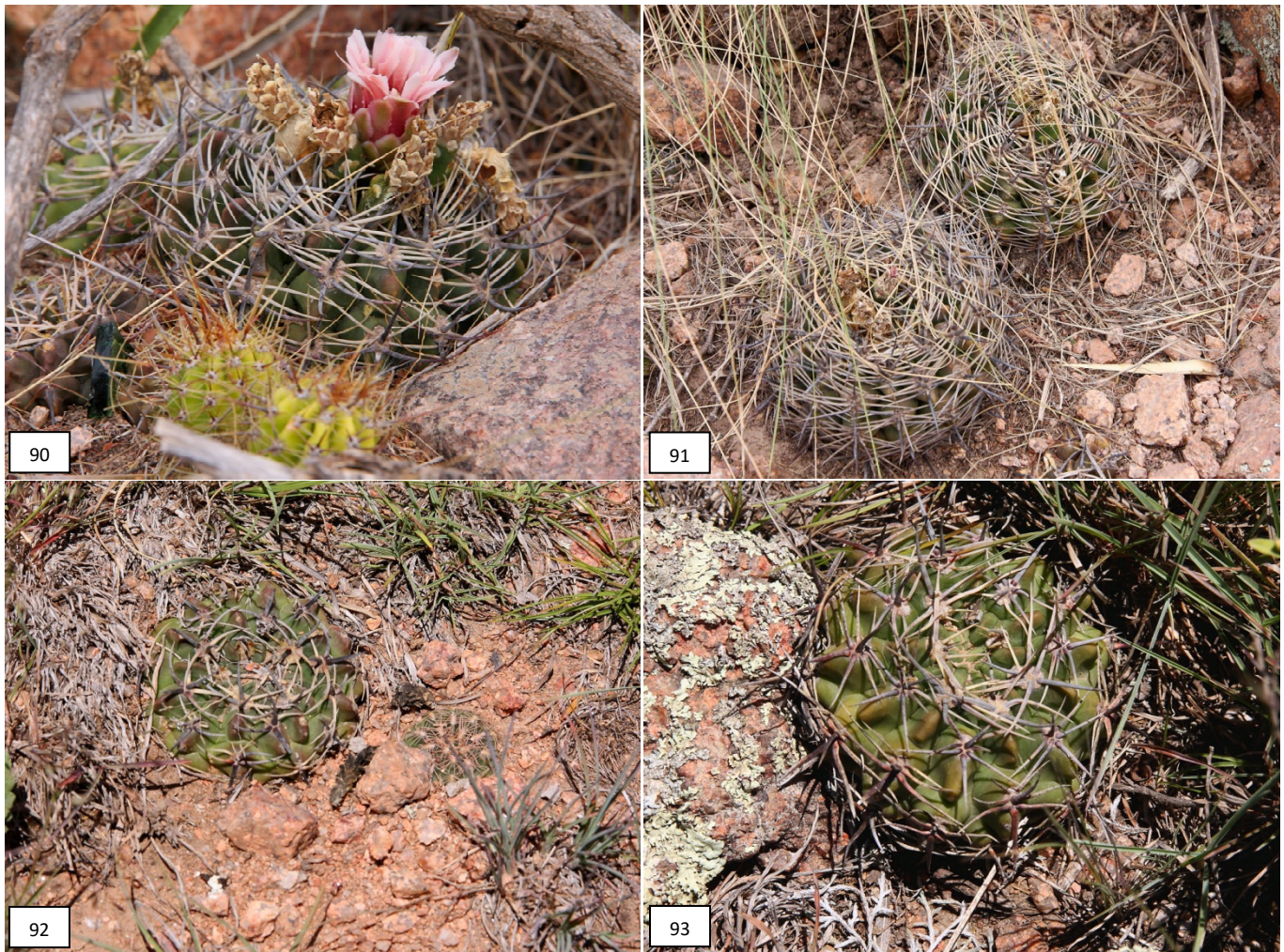


Fig 90-93: typical *G. simplex*, 3 km northeast of San Pedro Norte

## SUMMARY AND CONCLUSIONS

Fortunately we could find further localities of *G. prochazkianum* in natural surroundings apart from the type locality. The situation of the species is not good at its type locality. During a visit in 2004 Wolfgang Papsch and his companions found the site considerably damaged by logging and fire clearing (Papsch, personal conversation). Many specimens had certainly also been taken by collectors. We could only find some scattered specimens in 2013. On the whole it can be established that, due to the fact that the distribution area has been considerably extended by new localities, the species must fortunately not be considered as endangered in nature at the moment.

The appearance of *G. prochazkianum* in its natural surroundings is rather uniform. Differences in size at various localities can depend on the average age of the respective population. This can be investigated by means of cultivated plants as seeds were found at all the localities and plants cultivated from these seeds exist.

The type locality of *G. prochazkianum* is special insofar as here it is an exception for old plants, too, to have more than three spines per areole.

In 2006 Halda and Milt describe a *G. prochazkianum* *subspec. ivoi* (Halda & Milt 2006). Its locality is specified as “near Quilino at an altitude of about 1800 m above sea level”, although at the type locality the terrain rises merely to an altitude of about 460 m above sea level. The typus plant originates from cultivating seeds from a JPS-site (Jaroslav Prochazka), for which no particulars are given. According to Prochazka’s statement he (Prochazka) knew only the type

locality of *G. prochazkianum* at the time of the first description in 2006. To this effect and with regard to the variability of the species now known the description is superfluous.

Řepka und Koutecký (2013) describe the populations of Orcosuni, Los Algarrobos and Cerro Bañado as “for the most part intermediate” between *G. prochazkianum* and *G. simplex*. This matches my observations, with the plants at Orcosuni having a tendency towards resembling the appearance of *G. prochazkianum* and at Los Algarrobos rather resembling *G. simplex*. The plants are newly described as *G. prochazkianum* subsp. *simile* Řepka and ranked as subspecies. *G. simplex* is newly described as *G. prochazkianum* subsp. *simplex* Řepka.

As far as the actual *G. prochazkianum* is concerned, the authors only know the plants from the type locality (Řepka und Koutecký, 2013, map p. 109) by their own account. I agree with the authors insofar as *G. prochazkianum* and *G. simplex* are two related species. On the other hand, I do not agree with placing *G. simplex* as a subspecies with *G. prochazkianum*. At all the known and new localities of both species they can be clearly identified as the respective species and are well-defined by their characteristics. The localities near Orcosuni and Los Algarrobos are special. In my opinion an exchange of genetic material took place via pollen or seed transfer between the species *G. prochazkianum* and *G. simplex*. The plants of both localities show a wide variability within the variability of the parental taxa and I am of the opinion that they do not represent a subspecies transition between two taxa. They are hybrid populations, geographically situated between two species and thus should not be described as subspecies. The wide variability of the hybrid population plants is, in my opinion, a strong argument in favour of the existence of two species.

Demaio et al. (2010) commented on the close relationship of *G. prochazkianum* on the basis of a molecular data analysis. According to this, *G. prochazkianum* is a sister species of *G. mostii* (Gürke) Britton & Rose. As *G. simplex* and *G. bicolor* Schütz nom. inval., both of which are similar in spination, were not included in the analysis, the relationship between *G. prochazkianum*, *G. simplex* and *G. bicolor* has so far not been reviewed on a molecular basis. Distinct differences in appearance of body, flower and seed of *G. prochazkianum* and *G. simplex* support the existence of two species. I hold the opinion that the relationship of *G. simplex* and *G. bicolor* has not been settled conclusively yet. This is not the subject of this paper.

*G. bicolor* was placed to *G. valnicekianum* var. *bicolor* by Hans Till and Helmut Amerhauser (2002).

I have not visited the location at Cerro Bañado in person.

Picture 73: Thomas Strub, the other photographs by the author.

## LITERATUR

- Demaio, P; Barfuss, M. H. J.; Till, W.; Chiapella, J. (2010) Entwicklungsgeschichte und infragenerische Klassifikation der Gattung *Gymnocalycium*: Erkenntnisse aus molekularen Daten. – *Gymnocalycium* 23(Sonderausgabe): 925-946.
- Halda, J. J.; Milt, I. (2006) *Gymnocalycium prochazkianum* V. Šorma subspec. *ivoi* J. J. Halda et I. Milt subspec. *nova*. – *Acta Mus. Richnov., Sect. Natur* 13(1): 10-16.
- Papsch, W. (2002) *Gymnocalycium prochazkianum* vorgestellt. – *Gymnocalycium* 15(1): 437-440.
- Řepka, R.; Koutecký, P. (2013) *Gymnocalycium mostii* aggregate: Taxonomy in the northern part of its distribution area including newly described taxa. – *Bradleya* (31): 96-113.
- Šorma, V. (1999) *Gymnocalycium prochazkianum* – nový zajímavý nález českých kaktusářů v Argentiniě. - *Gymnofil* (1, 2): 2-6.
- Till, H.; Amerhauser, H. (2002) Revision des *Gymnocalycium mostii*-Aggregates Teil 2: *Gymnocalycium valnicekianum* und seine Formen. – *Gymnocalycium* 15(2): 445-452.