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Cover picture: *G. kroenleinii* subsp. *funettae* MM 977 in habitat.

**A new subspecies of *Gymnocalycium kroenleinii*
Kiesling, Rausch & Ferrari, and notes on the type
form.**

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Abstract. After a short summary about the original collections and description of *Gymnocalycium kroenleinii*, the author describes his expedition to the north-eastern part of the Sierra de Malanzan, that led to the discovery of a new population of the species. Based on its morphological characters and the isolated distribution, the new population is referred to a distinct subspecies of *G. kroenleinii*, here described as *G. kroenleinii* subsp. *funettae* Meregalli, n. subsp.

In November 1987 Roberto Kiesling, Walter Rausch and Omar Ferrari explored the higher slopes of the Sierra de Malanzan, finding specimens of a *Gymnocalycium* under the numbers RK72 and WR805. This species, based on its morphological characters, was first considered to be a form of *G. quehlianum* or *G. intertextum*, both species belonging to subgenus *Trichomosemineum*. The plants were cultivated and when seed was examined it proved to belong to the subgenus *Gymnocalycium*. This observation prompted Ferrari, Kiesling and the Argentinian collector Silvio Meglioli to further explore the type locality in November 1994 in order to obtain more data on this species and its habitat. Based on these observations, and with the knowledge of the young plants grown from seeds, the authors proceeded with the description in 2000.

In the original description the type locality was simply indicated as "Argentinien, Prov. La Rioja, Sierra de Malanzan, 1300 m", without any further information.

In December 1999 I had met the late Omar Ferrari and Roberto Kiesling for a nice trip to Uruguay. After the trip, during a visit to his "vivero" near Buenos Aires, Omar gave me some vegetative propagations from the original plants of *G. kroenleinii*, at the time yet undescribed, and told me that the collection locality was the Sierra de Argañaraz, a part of

the Sierra de Malanzan. Some years later, I discovered that this sierra lies in the southern part of the Sierra de Malanzan, east of Noqueve.

I was asked not to divulgate the original collection locality, so I kept the records to myself. At the beginning of the 21st century, seeds and plants of *G. kroenleinii* became freely available to amateurs, mainly as propagations of the WR805 collections.

Several years later, in January 2008, when organizing an expedition to Argentina together with Andrea Funetta, I was interested in finding this interesting species again. We planned the expedition mainly by looking for side roads and tracks on Google Earth. It was clear that in 1987 Ferrari and friends had reached the higher slopes of the Sierra by some small mountain roads, but no such road was indicated on our maps - not even on the military maps available to us - so we looked for some possibility to reach high altitude habitats using the satellite photographs. The Google Earth resolution for Argentina in 2008 was far from being acceptable, much worse than today, so it was rather difficult to locate any mountain road. Obviously, it is always possible to ask local inhabitants about the possibility of reaching the higher parts of the Sierras, so we also thought of trying this solution in case of not having previous information.

Anyway, we spotted on Google Earth a small road reaching high altitudes in the Malanzan mountain complex, though quite far from the Sierra de Argañaraz. This road was in fact climbing the range situated northwest of Olta. Since plants from the type locality were already freely available, we changed our minds and decided to reach this new, and previously unexplored, locality, hoping that we would also find *G. kroenleinii* there. This area is indeed quite isolated from the Sierra de Malanzan, so it was even more interesting for us.

On a foggy and rainy day we found the beginning of the track, some 20 km south of Tama, and started driving along it. It was a rather good road, better than most of the tracks we were used to driving, and it reached mountain houses used by cattle breeders with even some facilities for tourists. Soon after the start of the track we spotted a shield with the indication "Sierra de Quintana" - a name not reported on our military maps, and also not found in a search on Google, not even now, excluding the references in some Cactaceae web pages. The track starts at about 930 m. Until reaching more than 1200 m it goes through sparsely forested and shrubby patches, with rocky outcrops of greyish granite. A strongly spined form of *G. castellanosii* was extremely frequent in this area, together with *G. saglionis*. Some of the larger plants of *G. castellanosii* were even difficult to differentiate from *G. saglionis*. Here and there, but quite sporadic, was also *G. schickendantzii*. We

reached a kind of plateau with pastures, and from here we followed the indication for the Cerro de los Condores. After a few more km, at 1440 m altitude, we spotted a different habitat, with slightly pinkish granite. It looked very promising, so we stopped.



Figs 1–2. Sierra de Quintana, 1440 m. Rocky habitat with mountain pampa vegetation. Large rocks of grey granite and small stones of pinkish granite.

Soon after starting the search, we found the first specimens of a *Gymnocalycium* clearly belonging to the subgenus *Gymnocalycium*. From the generality of its characters we had no doubts that it belonged to *G. kroenleinii*, at least in a broad sense. We spent much time there, in spite of the cold and rainy weather. The population was quite rich in plants, and we could observe the variation in spination and body shape.



Figs 3–4. *G. kroenleinii* subsp. *funettae* MM 977 in habitat. Plants were in full growth after much rain, in small gravel of pinkish granite.



Figs 5–10. *Gymnocalycium kroenleinii* subsp. *funettae* MM977. Plants in habitat. Some small clumps were present, apparently not caused by many-headed regrowth after damage.

It was an exciting discovery on a fantastic trip, during which we had also found *G. esperanzae*, then unknown, and several other previously unknown populations of various species. A bottle of good wine, particularly appreciated in the fog and rain, was our much deserved reward!

Information on this new locality was communicated to Graham Charles, who was completing his book on the genus *Gymnocalycium* (Charles, 2009). The new data were reported in the treatment of *G. kroenleinii*, with two photographs and a map showing the two distinct localities for the species (Charles, 2009: 102, figs 200–202; 103: map 26).

Two years later we returned to the Sierra de Malanzan area. This time we wanted to reach the Sierra de Argañaraz, in order to gather deeper information on the type form. South of Noqueve it was quite easy to find a relatively poor track reaching the higher parts of the Sierra. In rocks near a broad flat area named El Playon, at 1270 m, we found, again in slightly pinkish granite, a population of *G. kroenleinii*. In this place the specimens were sympatric and often syntopic with *G. castellanosii*. The plants were not very frequent here, but the track proceeds further on and gets near to one of the peaks of the southern part of the Sierra de Malanzan. It is likely that the species is quite broadly distributed all over this part of the Sierra Malanzan above 1250 m in the rockiest places. At the time of our visit the plants were rather dehydrated after a prolonged period of nearly complete draught.

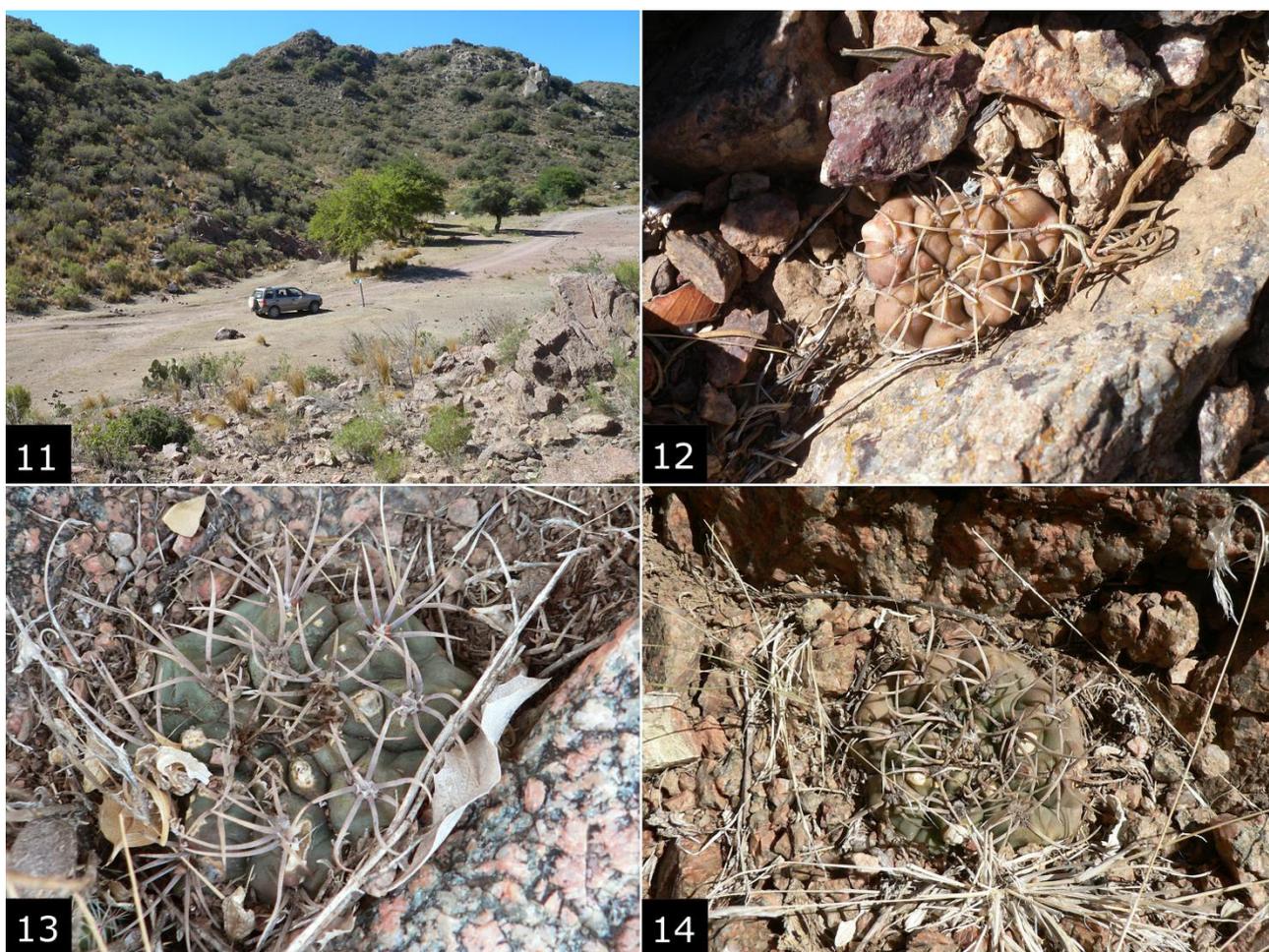


Fig 11. Habitat at El Playon, Sierra de Argañaraz. Figs 12–14: *G. kroenleinii* subsp. *kroenleinii*. Plants in habitat.

Since then some plants from the two populations were studied in cultivation, and it became clear that they are reciprocally differentiated in several characters.

From a geographical point of view, the two localities are about 70 km apart as the crow flies. It is very likely that each population is relatively widespread in the higher slopes of the mountain chains that they inhabit, but they are clearly reciprocally isolated by the broad valley between Solca and Olta, that does not exceed 800 m altitude, an altitude (and habitat) where this species cannot live.



Figs 15–16. Distribution of *G. kroenleinii*. Fig. 15. Google Earth image. Fig. 16. Map taken from Encarta (Microsoft Corporation). Both maps enhanced with Photoshop CS3 (Adobe Systems Inc.)

Considering the small but significant morphological differences and the reciprocal isolation of the two forms, it seems justified to refer the population from the Sierra de Quintana to a distinct subspecies of *G. kroenleinii*.

The new subspecies is here described.

***Gymnocalycium kroenleinii* subsp. *funettae* Meregalli n. subsp.**

Holotype. Argentina, La Rioja, NW Olta, Sierra de Quintana, nr. Cerro de los Condores, 30°34'S 66°22'W, 1440 m, 25/01/2008, Meregalli & Funetta leg., MM977, ex cult. (TO-HG).

DIAGNOSIS. A subspecies of *G. kroenleinii* characterized by the spines light yellowish to nearly whitish, with more distinctly reddish bases, often longer and irregularly curved, interlaced, and the flower darker, creamy pink, with broader outer perianth segments, shorter and thicker pericarpel and round or shortly oval ovary. The body seems to be more freely forming small many-headed clumps.

DESCRIPTION. (differential characters from *G. kroenleinii kroenleinii* underlined) **Body** simple or moderately clumping, forming small groups with up to 8-10 heads, single heads up to 5–6 cm across, shortly globose or more usually flattened, often partly buried in the soil. **Ribs** 8–10, straight, rather broad, with prominent, sub-angular chins, higher elevation of chins more or less at mid-length between areoles, longitudinal clefts broad, linear; transverse furrows nearly extended through the whole rib, deepened in median part, placed just above the areole. **Areoles** round, about 8 mm apart, with whitish hairs. **Spines** usually irregularly curved, partly interlacing, narrow and flexible, light coloured, often nearly whitish for most of the length, with very distinct darker, red-brownish bases, radial spines in 3–4 pairs, directed laterally or more distinctly curved upwards; central spines 1, erect; radial and central spines usually long up to 25 mm. **Flower** funnelform, up to 5 cm long, pericarpel short, as long as wide or slightly transverse, about 5 mm long and wide; receptacle dark greenish with a pinkish shade, with a few light pink semicircular scales, darker towards the tip; outer perianth segments broadly ovate, creamy pink with dark median stripe, inner segments spatulate, 4 times as long as wide, apex round, light creamy pink with a greenish median stripe, darker towards the top on external side, more uniformly creamy-pink internally, with a slightly darker narrow median line; throat broader,

dark pink to reddish; filaments light pink in apical half, pinkish in basal half; anthers yellow;
style whitish, yellowish towards stigma. **Fruit** shortly globose, about 10–12 mm across,
violet-green, scarcely glossy. **Seed** typical of subgenus *Gymnocalycium*, round, about 1.2
mm, with relatively dense cuticular folds.

ETYMOLOGY. This subspecies is named after my friend and colleague on some trips to
Argentina, Andrea Funetta.



Figs 17–22. *Gymnocalycium kroenleinii* subsp. *funettae* in cultivation.



Figs 23–26. *Gymnocalycium kroenleinii* subsp. *kroenleinii* WR805 in cultivation.

DISTRIBUTION. The subspecies is native to the mountain range northwest of Olta, above 1300 m, and it is probably restricted to this Sierra. Based on our observations, the rocky habitats with quartz rocks where this taxon lives seem to be quite widespread along the higher slopes of the Sierra de Quintana, and it is thus probable that *G. kroenleinii* subsp. *funettae* can be found in most of the areas where the substrate offers suitable conditions.

Conservation. Since the presence of this taxon was only documented from the type locality, nothing can be said. The population at the type locality of this subspecies was very numerous when we discovered it.



Figs 27–28. Flower of *Gymnocalycium kroenleinii* subsp. *funettae*, MM977. Figs 29–30. Flower of *G. kroenleinii* subsp. *kroenleinii* WR805.

Acknowledgements. I wish to thank my friend Graham Charles for the revision of the English text.

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All photographs Massimo Meregalli, except Fig. 26, Wolfgang Papsch.