

Gymnocalycium robustum (Cactaceae), a new species from Córdoba, Argentina

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On one of the trips made by two of us (O.F. and R.K.) some specimens of *Gymnocalycium* were found in the northwestern part of Córdoba province in 1982 and at the same locality in 1986 and 1987. After some comparison with previously known species, we considered them to be an undescribed species. H. Till (1993), an Austrian amateur devoted entirely to the study of this genus, believed that these plants were true *Echinocactus quehlianus*, and so we decided it would be better to delay publication of this new species until these differing viewpoints could be reconciled. After studying the nomenclatural history and the various arguments, we decided to follow the traditional use of the name *Echinocactus quehlianus* for a member of subgenus *Trichomosemineum* Schütz (see below). We therefore describe the plant of northwestern Córdoba as a new species.

Description

Gymnocalycium robustum R. Kiesling, Ferrari & Metzling **nov. spec.** *Cormus globoso-depressus, griseus, costis 9–11, undulato-gibbosis, tuberculis magnis, angulatis; areolis ellipticis, 5 vel 7 spinosis, spinis incurvis, rigidis, adpressis; floris subapicalis, infundibuliformis, extus griseus laxissime squamulosis, receptaculum obconicum, phyllis perianthi acutis candidis, staminibus distichis, stilo brevis, albo, lobuli stigmaticis 8–14 concoloribus coronato.*

Holotype: Argentina, Prov. Córdoba, Dep. Ischilín, Quilino, cultivated by Omar Ferrari under number FK 120; prepared for herbarium December 2000, R. Kiesling et O. Ferrari 9883 (SI).

Paratype: Argentina, Prov. Córdoba, Dep. Ischilín, Quilino, 19-XI-1987, R. Kiesling et O.

Ferrari 6787 (SI). Note: The paratype was collected and preserved in the field and consists of two complete stems, roots and several flowers. Specimens of the same collection were cultivated and one of them was used to prepare the holotype, which consists of a single plant with one fruit.

Other collections studied: Argentina, Prov. Córdoba, Dep. Ischilín, Quilino, cultivated by Omar Ferrari under number OF 5/82 (not preserved). Argentina, Prov. Córdoba, Dep. Ischilín, Quilino, cultivated by Omar Ferrari under number FK 34b, 22-XI-1986 (not preserved).

Abstract: A new species, *Gymnocalycium robustum* R. Kiesling, Ferrari & Metzling, is described here as new to science. It grows in the northwestern part of Córdoba province, Argentina, and belongs to subgenus *Gymnocalycium*.

Resúmen: Se describe una nueva especie, *Gymnocalycium robustum* R. Kiesling, Ferrari & Metzling, nov. sp. La misma crece en el NO de la provincia de Córdoba, Argentina, y pertenece al subgénero *Gymnocalycium*.

Key words: Cactaceae, *Gymnocalycium*, Taxonomy, Flora Argentina.



Figure 1. Plant in habitat, with a sectioned flower.



Figures 2 and 3. Cultivated plant in flower.



Roots thick, obconical, ca. 5 cm long, 2 cm maximum diam. Stems simple, globose-depressed, 3–5 cm high, 8–11 cm diam., epidermis gray or gray-green or slightly mauve, dull. Ribs 9–11, straight, 1.5 cm high, 2–3.5 cm wide, obtuse, with 3–5 areoles and, below them, a prominent chin (podarium) 0.5 cm high and a conspicuous transverse furrow. Areoles elliptic, 6 × 3 mm, with white hairs, a basal spine and 2–3 pairs of lateral spines; all adpressed irregularly against the podaria, rigid, chalk-white when dry, yellowish with a spot of brown at base and apex when wet; centrals 0.

Flowers ca. 6 cm long and 6 cm diam. when completely open (7 cm × 3 cm just before opening). Receptacle infundibuliform, 4.5 cm long, 0.8–1.4 cm diam., scales nearly sub-circular, wider than long: 0.4 cm long, 0.6 cm wide, succulent, pure gray or tinged reddish. Pericarpel slightly conical, 3 cm long, 0.5–0.8 cm diam. Ovary chamber conical, 2



Figure 4. Seeds of *G. robustum*.

cm long, 0.5 cm wide, ovules many. Style cylindrical, very short, just reaching the base of the first stamens, 1.3 cm long, 2 mm diam., white, with small tubercles. Stigma 8-9(-14!)-lobed, clear yellow, nearly 3 mm long. Nectary chamber pink, 0.4 mm long. Stamens many, the basal ones straight, shorter than the stigma and parallel to them, filaments 1.1 cm long, tuberculate at the base, anthers 2 mm long; the other filaments inserted in a continuous spiral, longer than the stigma, curved along the center, white, 1.5 cm long, anthers yellow, 2 mm long, 1 mm wide. Perianth rotate when completely open, with the outer segments similar to the scales but longer and with the transparent marginal area becoming gradually wider; inner segments white, pink at base, thin, lanceolate, acute, the innermost shorter than the intermediate ones.

Fruits clavate, rarely fusiform, gray, 4-4.5 cm long, 1.5-1.8 cm maximum diam., 1 cm diam. at the base; with pure gray scales. Seeds globose-truncate, symmetric, 1.2 mm long and

province of the Chaco, Occidental district (Cabrera, 1976), but the present vegetation has been modified by human activities.

The species is apparently endemic to the vicinity of Quilino. It was maintained by us in cultivation and in the herbarium under the provisional name "*Gymnocalycium cordobensis*". It belongs to subgenus *Gymnocalycium* (subgen. *Ovatisemineum* Schütz, nom. illeg. [Art. 52.1]). The name refers to the robust appearance of the plant, with its thick ribs and rounded podaria (which seem more conspicuous because of the few short spines) and its thick floral receptacle and fruit.

There are two characters of this species that are noteworthy: 1) the very short style and 2) the seeds, in which there is a nearly complete separation of the cuticle from the testa. These can easily be separated when wet, as they are attached only at a small area at the center of each cell. Only near the border is the cuticle firmly attached to the testa (Figs. 10-11, 13).

The separation of the cuticle is described (Bregman & Graven, 1997) as an effect of subcuticular secretion, improving the uptake of water by the seed.

Another curious fact is that one of the flowers preserved in the herbarium does not have a style, and this absence of a style has also been observed in the field by L. Díaz (pers. comm.), who is conducting studies on the floral biology of these plants. Stamens of all the plants seemed to



Figure 5. Plants with bud and fruit.

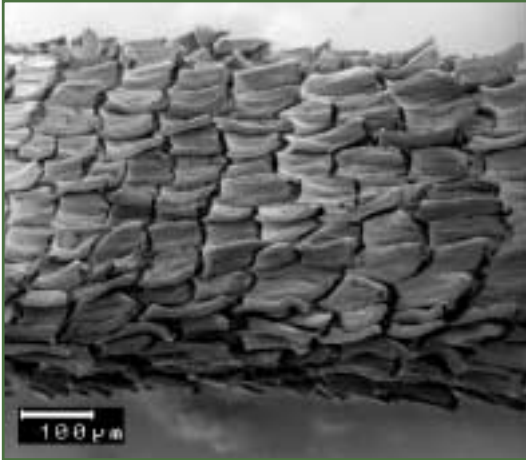


Figure 6. Spine surface.
[From the paratype.]

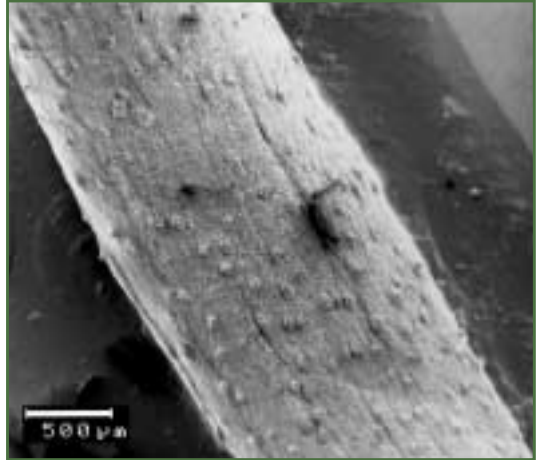


Figure 7. Style surface with tubercles.
[From the paratype.]

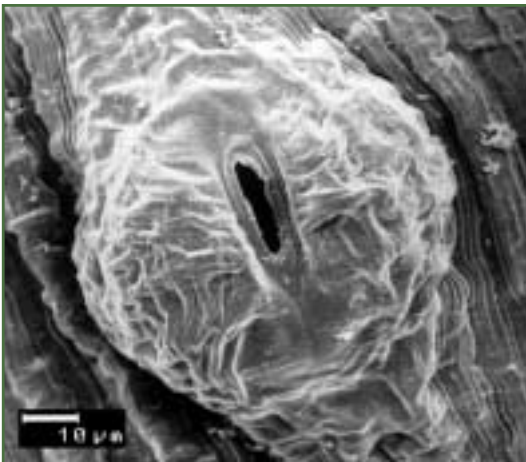


Figure 8. Non-functional (?) stoma on tubercle.
[From the paratype.]

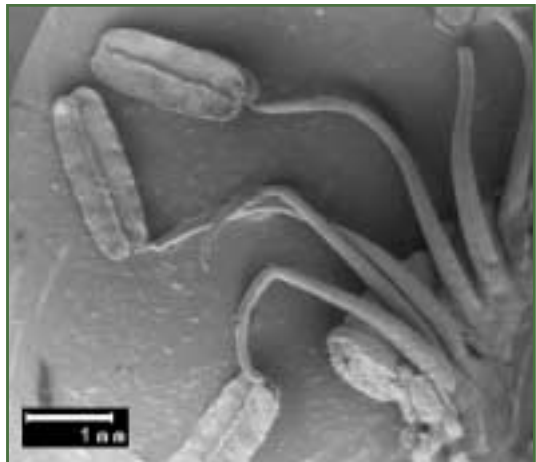


Figure 9. Basal stamens.
[From the paratype.]

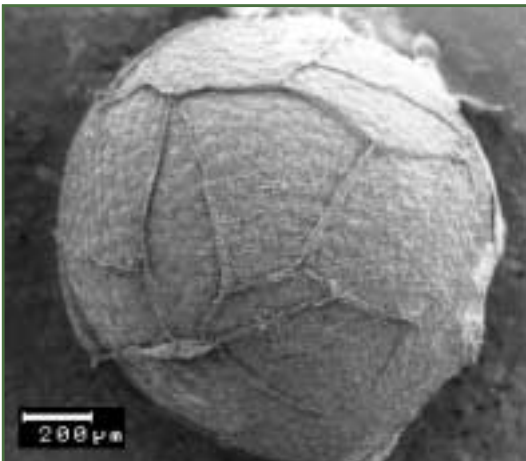


Figure 10. Seed covered by cuticle.
[From the holotype.]

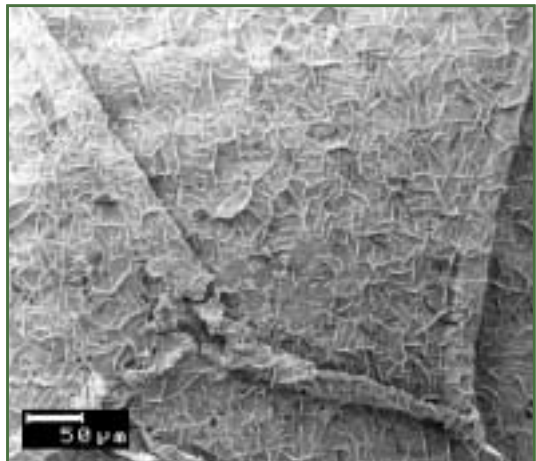


Figure 11. Detail of cuticle.
[From the holotype.]

produce normal pollen, but we did not pursue this investigation, which is being carried out by Díaz.

The lower filaments are papillate, whereas the style is minutely tuberculate. The tubercles on the style have an apical aperture resembling a nonfunctional stoma (Figs. 7 and 8). This micromorphological feature has not been mentioned before as occurring in the Cactaceae,

although they are found to some degree in several gymnocalyciums (Kiesling et al., in prep.).

As already mentioned, the species newly described here had led to some earlier confusion, as it shows a phenetic similarity to *Gymnocalycium quehlianum*—however, it belongs to a different subgenus. Both taxa may occur sympatrically in Córdoba, and Till (1993) applied the name *Echinocactus quehlianus*

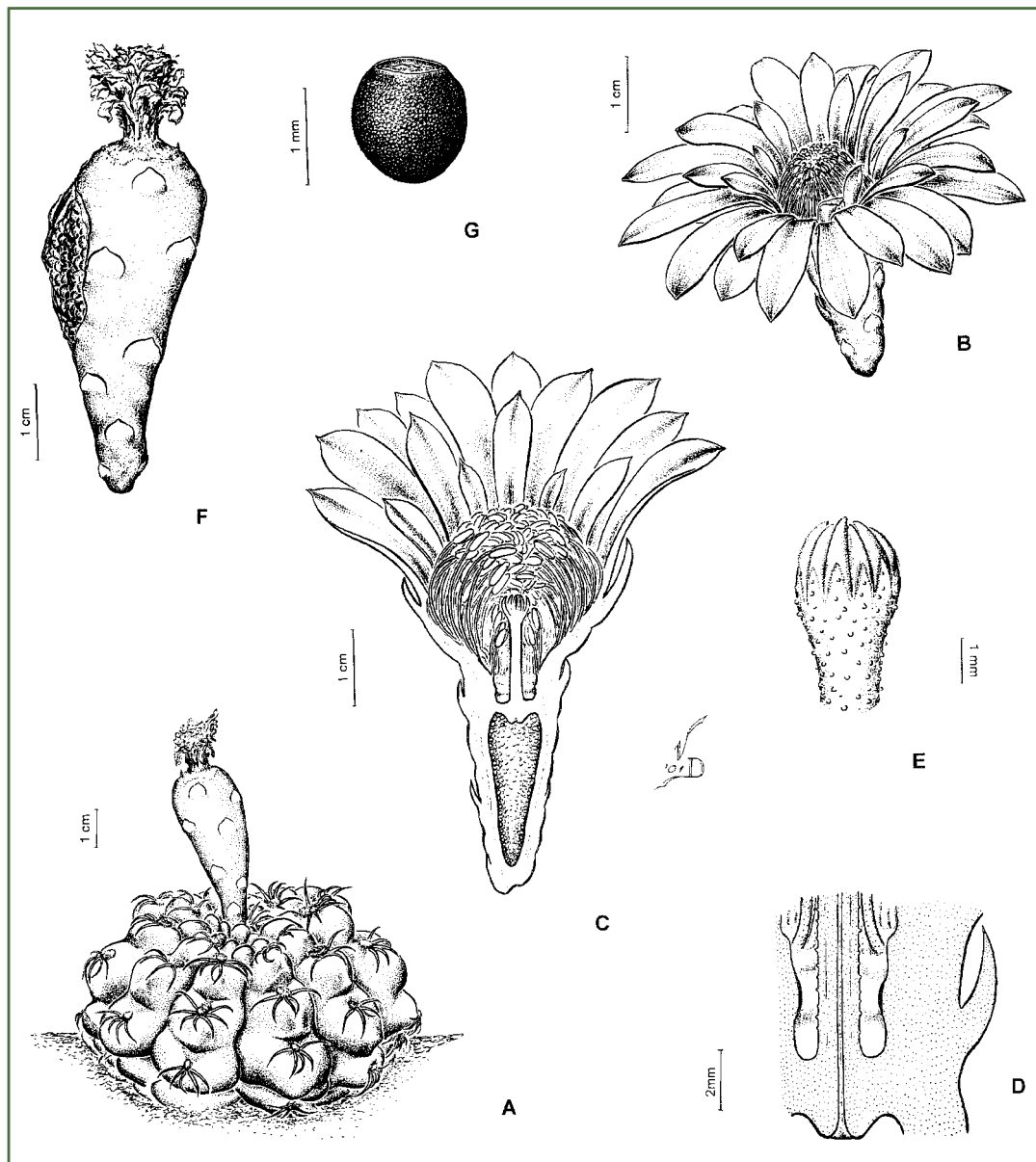


Figure 12. *Gymnocalycium robustum*. **A.** Fruiting plant. **B.** Perianth, showing the stamens curved at the center and the variable size of the perianth segments. **C.** Longitudinal section of the flower, showing the elongated ovarium, the short style, and the two series of stamens, one with short stamens above the nectar chamber, the other dispersed along the tube with stamens incurved over the style. **D.** Style base, with tuberculose surface, and nectar chamber. **E.** Style apex, with tubercles and stigma. **F.** Dehiscing fruit. **G.** Seed in lateral view. [A–E, from the paratype; F–G from the holotype.]

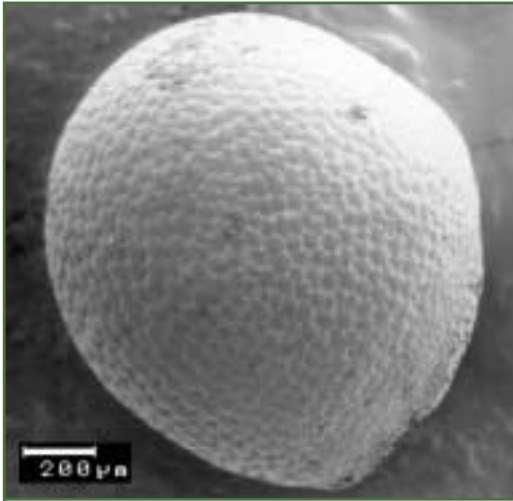


Figure 13. Seed with the cuticle removed.
[From the holotype.]

Haage ex Quehl (*G. quehlianum* (Haage ex Quehl) Vaupel ex Hosseus) to this species of subgenus *Gymnocalycium*, deviating from the traditional use of the name that had for a long time been applied to a very well-known species from the Valle de la Punilla—also in Córdoba province—belonging to subgenus *Trichosemineum*. This led to discussions about the identity of *Echinocactus quehlianus* (cf. Metzging et al., 1995: 219). To preserve the traditional usage of the name and also to stabilize infrageneric nomenclature, *Echinocactus quehlianus* has been neotypified with a specimen belonging to subgenus *Trichosemineum* (Metzging et al., 1999).

Perhaps the species closest-allied to *G. robustum* is one occurring in the northwestern part of the Sierra de Córdoba—*G. leptanthum* (Speg.) Speg., which differs in its less elongated flower and fruit and in its more robust spines and stem.

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Figure 4 by Francis Fuschillo; Figures 6–12 by Alejandro Escobar; Figure 13 (drawing) by V. Dudas; all others by Roberto Kiesling.

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