

Lophocereus schottii var *schottii* forma *spiralis* (Cactaceae)

AND NOTES ON THE MONSTROSE FORMS

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SUMMARY

The new forma *spiralis* CARTER & LEON for the senita cactus *Lophocereus schottii* (ENGELM.) BRITT. & ROSE var *schottii* is here described and illustrated. The only known population is on the Baja California Peninsula, below the 28°N parallel, 380 km south of the two previously known forms, (forma *monstruosus* GATES and forma *mieckleyanus* LINDSAY). Among other distinctive characteristics, this new form is shorter and its protuberances are arranged spirally along the branches. To protect this new form, it should be included in the CITES appendix I and in the Mexican “red list.” These odd forms are economically valuable resources because of their bizarre appearance. Under appropriate management these three forms could avoid irremediable loss of their fragile and small populations, because propagation practices would eliminate collection pressures on them.

Two different monstrose forms have been documented for the Senita Cactus, *Lophocereus schottii* var *schottii*; namely forma *monstruosus* and forma *mieckleyanus*^{1–3}. Both forms are located in approximately the same area of the central Baja California Peninsula,

Mexico, in the vicinity of the town of El Arco, BC, below the 28th parallel.

Nobody has convincingly explained the cause of the monstrose condition, that is if it is a phenotypic expression of any viable mutation (genetically based), or if it is linked to an environmental factor, or both. Under field conditions, the monstrose forms of *L. schottii* grow in uniform, dense clumps. Although flowering has been reported in the first two forms, seeds are unknown, and the plants are presumed sterile; propagation, then, seems to be exclusively vegetative, new shoots arising from fallen or prostrate branches lying on the ground.

The branches of both previously known monstrose forms are shorter than in normal plants, and the typical 4–7 vertical ribs disappear to give rise to protuberances in irregular positions, mainly in the basal area; also, the candelabra shape of the entire plant is lost to give place to a caespitose (tufted or clumped) appearance. Under cultivation, both forms seem to revert to normal growth², which implies that the monstrose growth is an incomplete genetic expression.

Hence, these monstrose populations may simply be clones of atypical growth responding to some unknown stimulus or deficiency in the environment. In other words, each monstrose form is derived from a single seed that has naturally subdivided and asexually propagated. All seem to be simply aberrant forms—without contributing to the genetic pool and without sexually reproducing, they appear to be evolutionary dead ends. Nevertheless, these morphological distinctions are worthy of recording taxonomically as forms.



Lophocereus schottii (ENGELM.) BRITT. & ROSE var *schottii* forma *spiralis* CARTER & LEON DE LA LUZ, forma nova. Planta *Lophocereus schottii* var *schottii* forma *spiralis* monstuosus et mieckleyanus similis, sed protuberantionibus basi spiratim ordinatis.

Type: Mexico, Baja California Sur, municipio de comondú: ca 20 km East of Cd. Constitución (dirt road to San José de la Noria ranch), sandy flat near Los Algodones, 200 m, 14 December 2001, José Luis León de la Luz 10088. Holotype: HCIB; Isotypes: to be distributed.

Branched plants from the topsoil forming clumps. Branches 6–12 cm in diameter, up to 1.9 m in height. Ribs discontinuous, replaced by spiral protuberances basally and random protuberances apically. Areoles unknown. Spines, rarely present and vestigial. Flowers, fruit and seeds unknown.

Table 1 summarizes the main features for the three monstrose forms of *Lophocereus schottii* var *schottii* (following reference 2). Then, the main diagnostic characteristics for the new form are the shortness of the branches, the apparent non-development of flowers, and, most importantly, the spiral arrangement of the protuberances toward the bases of the older branches.

In January 2002, during botanical explorations in the Sierra de la Giganta, on the Baja California peninsula, Mexico, near Cd. Constitución, Baja California Sur, we discovered a population of a monstrose form of *Lophocereus schottii* var *schottii* that at first we thought could be ascribed to forma *mieckleyanus* known from 380 km north of this new location, and we published this find⁴. More recently, however, while revising the Annetta M Carter collections notebook, a gift I received from that brave explorer-botanist of the Sierra de la Giganta during the period 1949–1989, I realize that Miss Carter also found this same population on 25 October 1964 (A. Carter 4868). Carter was meticulous with all their plant collections and identifications, consulting with the relevant plant group specialists of the day for each identification. Recognizing it as a new form (Fig 1), she designated (but never published) it as forma *spiralis*. Its description follows.

Since the monstrose forms have high economic value in the horticulture trade, they are at risk of poaching, so we cannot reveal the exact locality for forma *spiralis*. The site is now accessible by car and does not have any protection from looting. Once authorities take care to protect the site, its position can be revealed publicly.

It is important to remark that these three monstrose forms, aside from their scientific value, have economical potential that in Mexico has been overlooked. In the Desert Botanical Garden (Phoenix, AZ) there are 3 m tall individuals of the other monstrose forms of this species valued at about \$2000. Smaller plants in other nurseries sell for \$50–70. Sierra de La Giganta ranchers are poor people who need opportunities to increase their incomes with activities that do not adversely impact the environment. Currently, they make charcoal from mesquite (*Prosopis* spp), activity that is gradually changing the natural balance of the ecosystems. Propagation and sale of endemic cacti could provide a sustainable income for

local people while simultaneously protecting wild plants from illegal collecting. In this particular case, the statement “the best way for conservation is by management” fits perfectly.

The forms *mieckleyanus* and *monstuosus* are both protected by the environmental Mexican laws⁵, namely NOM-126-ECOL-2000 under category R. That is, they are endemic taxonomic entities with small distributions and in low abundance. The form *spiralis* should be included in this list.

Finally, the CITES⁶ appendix II includes the entire cactus family, but the forms *mieckleyanus* and *monstuosus* are not included in the appen-



Table 1 Comparative features of the three monstrose forms of *Lophocereus schottii* var *schottii*.

| | FA MONSTRUOSUS | FA MIECKLEYANUS | FA SPIRALIS |
|---------------|---|---|--|
| color | green-yellowish | green | green |
| stem diameter | 10–15 cm | 5–8 cm | 8.3 cm* (up to 12.3 cm) |
| stem height | 2–3 m | 3–4.5 m | 1.3 m* (up to 1.9 m) |
| flowers | few, almost normal, apparently sterile | abundant, almost normal, apparently sterile | unknown |
| protuberances | upward, truncated below. | irregular in shape | irregular in shape, in spiral disposition. |
| ribs | apical and short, end in a protuberance | apical, discontinuous, end in a protuberance | none |
| areoles | irregular (2–4 mm) | on protuberances (1–2 mm) and ribs (5–8 mm), woolly | unknown |
| spines | on rib areoles | on rib areoles | vestigial and irregular |

*based on 15 measurements.

dix I. It is important to include in this appendix all three forms, since this regulates under strict ordinance the taxa that are matter of commercialization, forbidding field extraction. ❖

References

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3 WIGGINS IL. 1980. *Flora of Baja California*. Stanford University Press, Stanford, CA. 1025 p

4 MEDEL-NARVÁEZ A, LEÓN DE LA LUZ JL. 2002. Una nueva localidad y notas sobre la variedad *mieckleyanus* de *Lophocereus schottii* var *schottii*. *Cactáceas y Suculentas Mexicanas*. Tomo XLVII: 4:87–90.

5 DIARIO OFICIAL DE LA FEDERACIÓN. 2000. *Protección Ambiental.- Especies de flora y fauna silvestres de México.-Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio.-Lista de especies en riesgo*. Secretaría del Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP). México, D. F.

6 US FISH AND WILDLIFE SERVICE. 1990. Appendix I, II and III to the Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora. US Fish and Wildlife Service, US Department of the Interior. Washington, DC.

