

***Arthrocerus microsphaericus*, or the danger of wanting to synonymize everything and anything**

Joël Lodé (France)

e-mail: joel@cactus-aventures.com

In the Cactus family, we have sometimes observed misinterpretations that may lead to a chain of errors as is the case with ***Arthrocerus*** even now. It is quite hazardous intending to clarify some facts, as it may even be counterproductive; however, in my work of Taxonomy of Cactaceae revision, Description of the species, I had no choice, and here are my long investigations and possible changes proposed.

1890.

In 1890, in the *Flora Brasiliensis, enumeratio plantarum in Brasilia hactenus detectarum* vol.4 part 2 of Martius, Karl Schumann published several taxa corresponding to what we name today ***Arthrocerus*** and between others, in the following order:

- *Cereus microsphaericus* K. Schum. 1890,
- *Cereus glaziovii* K. Schum. 1890.

As Taylor & Zappi combined *C. glaziovii* into ***Arthrocerus glaziovii*** in 1991, we must assume that *Cereus glaziovii* was valid in 1890, and therefore *Cereus microsphaericus* too...

The story of these taxa is absolutely confusing; in fact ***Arthrocerus glaziovii*** was created to be the new type of the genus ***Arthrocerus*** because, according to Taylor & Zappi (1991), "*Cereus microsphaericus* Schumann is to be reckoned a synonym of ***Schlumbergera obtusangula*** (Schumann) D.R.Hunt (1969)". Moreover, they added that the plant for which the name ***Arthrocerus microsphaericus*** has been used is referable to *Cereus glaziovii*, *Cereus damazioi* being itself supposedly a synonym of the former.

If we read the original Schumann's description of both plants (redacted all in Latin), they are quite different. The first one ('*microsphaericus*') is a terrestrial, dwarf, articulated-branched plant, prostrate, 7-9 mm Ø, growing on gravelly sand and found (presumably) in Rio de Janeiro, Brazil by Glaziou.

The second one ('*C. glaziovii*') is described as terrestrial, short, erect, ribbed, found in Pico d'Itabira do Campo, Minas Gerais, Brazil. They are obviously distinct and Schumann was not mistaken. Thus, the interpretation that *C. microsphaericus* being a ***Schlumbergera*** instead was not based on the articulate-spherical segments of the plants, which has nothing to do with a ***Schlumbergera***, but with the given occurrence, 'Rio de Janeiro', which is not possible according to the description. However, botanists think that *Cereus microsphaericus* was in fact a ***Schlumbergera***, for nothing more than its presumed origin, Rio de Janeiro. In other descriptions, Schumann put "probably" for some localities, it is to say that he wasn't sure of the origin of the plants sent to him.

On the same page, Schumann described *Cereus obtusangulus*, a plant rather distinct with articulate, cylindrical stems (3-8 mm in diameter) with a zygomorphic flower.

1900: a publication of Schumann shows a drawing of a flowering *Cereus obtusangulus*: the zygomorphic flower leaves no doubts, as well as the stems, which are articulate and short-cylindrical, as well as ribbed. Description precises that the plants is epiphytic, flowers are pink-red to carmine-red. Obviously, this taxon has nothing to do with *Cereus microsphaericus*. Well, only the occurrence indicated is the same: Rio de Janeiro. However, in the case of *C. microsphaericus*, this data could perfectly be wrong. Why not?

1903: *Cereus damazioi* is described by Schumann, however, declared invalid. In 1991, Taylor argued that this name is referable to *Cereus glaziovii* and choose to establish the type of **Arthrocereus** with that name! For more confusion, Taylor expresses "this is necessary because *C. microsphaericus* Schumann is to be reckoned a synonym of *Schlumbergera obtusangula* (Sch.) D.Hunt!

The only botanist who had the good feeling about this taxon was Alwin Berger.

1905: Berger changed *Cereus obtusangulus* into *Epiphyllanthus obtusangulus*, which is the correct option at that time, because of the zygomorphic, purple rose flowers of this taxon.

1911: In 1911, Weingart completed Schumann's description after his death, saying that plants (*C. Damazioi*) received in Berlin botanical garden from Pr Damazio in the summer of 1902 came from Ouro Preto, Minas Gerais (not Rio de Janeiro as previously stated!). Very advised, Weingart wrote: "I must point out that Schumann has very probably named and described the same *Cereus* earlier, in Martius flora of Brazil", and "The *Cereus microsphaericus* K. Schum. is now, in my opinion, identical to *C. Damazioi*". He corroborates what I also personally think. Now, we can understand that there is one and only taxon; Rio de Janeiro was simply a mistake for *C. microsphaericus*.

1918: Lofgren modified *Cereus obtusangulus* into *Zygocactus obtusangulus* [which will be changed later by Hunt as *Schlumbergera obtusangula* (K.Sch.) Hunt in 1969]. Lofgren created also *Z. candidus*, which later, will help him to say that it is the same plant than *C. microsphaericus*, because both have white flowers! Indeed, in the New Cactus Lexicon, Hunt *et al.* (2006) presented a *Schlumbergera microsphaerica* (K.Sch.) Hoev. with the following synonyms: *Zygocactus candidus* Loef. 1918, *Epiphyllanthus candidus* (Loef.) Br.&.R. 1923 and *S. microsphaerica* ssp. *candida* (Loef) Hunt 1995. Confusion is total.

The same year, Quehl published an article on *C. Damazioi*, illustrated with a picture of Rettig, representing 2 grafted plants and another on its own roots, all of three in flowers: we can believe Weingart when he supposed in 1911 that *Cereus Damazoi* and *C. microsphaericus* are the same plant; the picture is without a doubt representing *C. microsphaericus*, but named *C. damazioi*! The plant was as early as for sale in **1908** at the Karl Knippel nursery under *C. damazioi*!

1923: about *Cereus obtusangulus*, in The Cactaceae, Britton & Rose said that Berger did it so well that they wrote: "his statement regarding it is so clear that we quote from it as follows:" etc. Despite this, Britton & Rose committed probably the first error by mixing both taxa and combined a new name *Epiphyllanthus microsphaericus*, with *Cereus microsphaericus* and *Epiphyllanthus obtusangulus* as synonyms, stating that flowers are purple to rose: this is correct for a **Schlumbergera**, but *C. microsphaericus* has funnel-shaped, white flowers! Moreover, *Cereus obtusangulus* is distinct, and has obviously to be classified, with its zygomorphic flowers, within what we name today **Schlumbergera**. One more time, the mistake was probably done

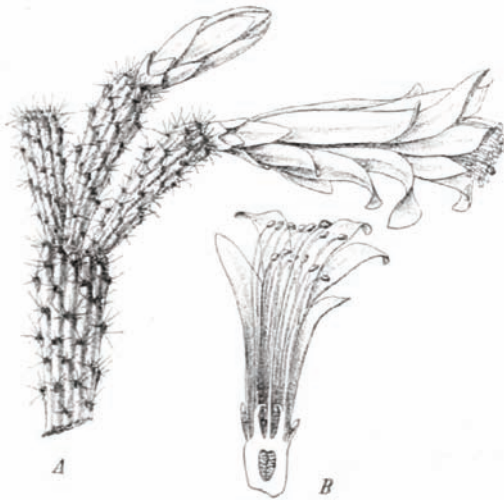


Fig. 30.

Cereus obtusangulus K. Sch.

A. Oberer Teil einer Pflanze. B. Blüte im Längsschnitt.
Original von T. Gürke.

1



2

Fig. 190.—*Epiphyllanthus microsphaericus*.



Cereus Damazioi K. Sch.

3 Von Herrn Rettig photographisch aufgenommen.

Fig. 1: in Schumann's publication of 1900, a drawing of Gürke, shows *Cereus obtusangulus*, with an unambiguous zygomorphic flower, named *Zygocactus obtusangulus* by Lofegren (1918), then *Schlumbergera obtusangula* by Hunt (1969) and finally, *Schlumbergera microsphaerica* by Hoeve (1970), followed by the same Hunt (2006).

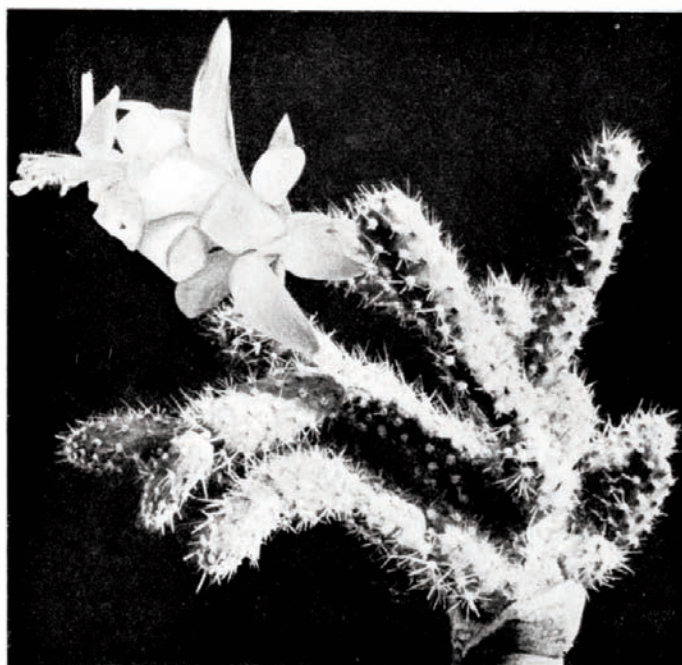
Fig. 2: drawing of the supposed *Epiphyllanthus microsphaericus* in Britton & Rose, 1923, said to be terete or obtusely angled but probably mixing two plants; in the description, *Cereus obtusangulus* is synonymized and there is nothing about the typical articulate, spherical stems of the right plant, which seems to be *C. microsphaericus* with improbable and zygomorphic additional flowers of a *Schlumbergera*.

Fig. 3: in Quehl's article published in *Monatsschrift für Kakteenkunde*, 1918, a picture of *Cereus damazioi* by Rettig shows two plants grafted in the background, one on its own roots in the front: these plants are beyond doubt the real *Arthrocerus microsphaericus*.



Arthrocerus microsphaericus. Aufn. Andreae

Illustration of *Arthrocerus microsphaericus* in Backeberg's article, *Kakteenkunde* 1943.



Epiphyllanthus obtusangulus. Aufn. Kozelsky

Illustration of *Epiphyllanthus obtusangulus* in the same journal.

because the first one (*C. microsphaericus*) is said to come from Rio de Janeiro, and the second one (*C. obtusangulus*) 'probably from Rio de Janeiro'. It's amazing to say that the first one is more probably from Minas Gerais (state occurrence for **Arthrocerus**), and the second one was in fact from Rio de Janeiro (state occurrence for **Schlumbergera**).

1929: in his book "Kakteen", again, Berger was totally right in describing his new **Arthrocerus** genus with the type *Cereus microsphaericus* and putting *C. damazioi* into synonymy; moreover, the occurrence is rectified, with Ouro-Preto, Minas Gerais as the locality. We should now use this name: **Arthrocerus microsphaericus**, type of the genus.

1943: in the German journal Kakteenkunde (3), we have a well illustrated article of Backeberg on the genus **Arthrocerus** where **A. microsphaericus** is, according to this investigation, correctly listed; Backeberg gives the origin of Rio de Janeiro (as stated by Schumann), although he suggests that the occurrence would be better Minas Gerais, where other **Arthrocerus** are found. He added that "*The synonymy between Cereus microsphaericus and Cereus damazioi is obvious*". Moreover, we have incidentally, in the same journal, a short article by von Wiesner on the genus *Epiphyllanthus* where *Epiphyllanthus obtusangulus* (K. Schum.) Borg. is illustrated; thus we easily can compare the two plants and see they are distinct taxa.

Despite all this, based on the -false- assertion that *C. microsphaericus* is a plant from Rio de Janeiro, also despite the fact that the articulate-spherical stems do not fit the description of a **Schlumbergera**, the following combinations and literature will not help to clarify the situation:

1957: Buxbaum synonymized *C. microsphaericus* and created *Zygocactus microsphaericus*.

1969: Hunt created *Schlumbergera obtusangula*.

1992: Heath combined and created *Schlumbergera microsphaerica* and *S. microsphaerica* var. *obtusangula*, and also *Arthrocerus damazioi* tentatively validated by Romulski in 2019.

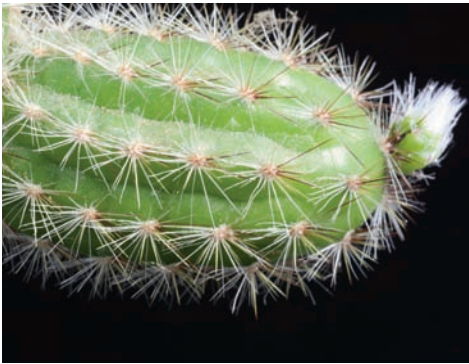
1994: in the British Cactus & Succulent Society (2, p.87) an article of Powell shows a picture of a supposed **A. microsphaericus**; in fact, in a footnote, the author admit that the plant pictured is probably *A. campos-portoi* (a supposed synonym of **A. glaziovii!**). Confusion is still active.

2001: in his "Cactus Family", Anderson follows Taylor (1992) and considers *C. microsphaericus* now recognized as a synonym of *Schlumbergera microsphaerica*.

2006: following Taylor's error, Hunt *et al.* write "*C. microsphaericus* was in fact a **Schlumbergera**" and accept the combination of Hoevel, *Schlumbergera microsphaerica* (with terete or obtusely angled segments) and said that "Berger's identification of *Cereus microsphaericus* as a species of **Arthrocerus**. **A. microsphaericus** (K.Sch.) Berger 1929 is now discounted"!

For me, two facts are clear: they probably have never seen the real plant and they have probably missed some older German literature!

2014: Mottram goes the same wrong way and write that Berger (1929) misinterpreted *Cereus microsphaericus* K.Schum. and put *Cereus damazioi* K.Schum. in its synonymy. In fact, Berger was right in synonymizing *C. damazioi*: his description perfectly fits into that of *C. microsphaericus*. One more time, this is the occurrence (Rio de Janeiro), which is more than probably the mistake, as it often occurred in old descriptions.



The true *Arthrocerus microsphaericus* in culture. © Elton Roberts

Finally, we have excellent and recent pictures of Elton Roberts about his plants, showing all the details of what is the real **A. microsphaericus**, whose name could not be better to describe this plant. Unfortunately, it seems that there is only one clone in cultivation, so, we cannot get and make the description of seeds.

Internet is now full of this error and it will be difficult to eradicate the too many websites which adopted the erroneous concept of a synonymized **Arthrocerus microsphaericus**, whose name is correct, because it is definitely not a **Schlumbergera**!

Here follows a more complete description of the species in the future Taxonomy of Cactaceae vol. 3, to be published:

Arthrocerus microsphaericus (K.Schum. emend. Weingart) A.Berger
Kakteen (Berger) 146. 1929.

Basionym: *Cereus microsphaericus* K. Sch., in Fl. Bras. (Martius) 4(2): 197 (1890).

Type: Brazil, 'Rio de Janeiro' (probably Minas Gerais, near Ouro-Preto), on sandy soil, *Glaziou* s.n. Lectotype: Romulski, 2019, in Quehl, Monatssch. für Kakteenk. 28, unnumb. illustr. opp. p.62 (as *C. Damazioi*, syn.) (1918), the illustr. cited. Not *Cereus glaziovii* as stated by Taylor (1991).

Synonyms: *Arthrocerus damazioi*, *Cereus damazioi*, *C. microsphaericus*.

non Cereus obtusangulus, *non Epiphyllanthus microsphaericus*, *non E. obtusangulus*, *non Epiphyllum obtusangulum*, *non Schlumbergera microsphaerica* var. *obtusangula*, *non S. obtusangula*, *non Zygocactus microsphaericus*, *non Z. obtusangulus*.

Etymology: "small sphere", referring to the small, articulated, spherical segments of the species.

Shape & habit: dwarf body (making clumps of ± 50 cm broad in culture, E.Roberts pers. comm. 2019); stems short, branched, divided into articulate joints, detaching easily, spherical to elliptical, 3-5 cm long (up to 30 cm long in culture), 1.5-2.5 (-3) cm Ø, shiny fresh green.

Ribs: 8-11, low, slightly notched, with shallow grooves.

Areoles: very small, 1 mm Ø, close-set, 2-4 mm apart, slightly woolly.

Spines: unequal, 2-5 mm long, some longer at the tip of the stems, up to 2 cm long, falling out very soon; **centrals** 4-12, brownish, thickened at their base; **radials** about 12, white; all bristle-like, plus about 12 bristles, especially in the lower part of the areole, hyaline.

Flowers: nocturnal, appearing laterally, lasting only one night, self sterile, slender funnel-shaped, 10-11 cm long, 5 cm Ø; pericarpel with tiny scales and grey, curly hairs; tube elongated, slender, green, with brown and grey hairs; outer tepals linear lanceolate, pointed, green; the following broader, pointed, white with green center; inner tepals shorter, white, smell of apples; filaments few, short, white, stylus as long, lobes 8, white.

Fruits: spherical.

Seeds: not described.

Habitat: grows on sandy soil, no more data.

Distribution: Brazil (Minas Gerais).

Notes: a long and deep investigation was necessary to know what happened to this taxon, erroneously taken as a **Schlumbergera** (Lodé 2020).

Threats & cultivation status: probably habitat destruction through intensive mining; very rare in culture, although easy to propagate, from stem segments.

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The true *Arthroocereus microsphaericus* flowering. © Elton Roberts

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