Huitzilopochtlia

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In the previous issue I expressed the hope that aficionados of the genus would be stimulated by the two new series of distribution maps of Mammillaria to study and compare them and help improve them. That there would be plenty of scope for improvement was apparent from the initial comments I mentioned from John Pilbeam and Chris Davies. In this issue I am taking up Chris's valid point that whatever the source of locality data: habitat photos, herbarium specimens, or personal records, its usefulness is dependent on correct identification. Chris queried the reliability of the records of Mammillaria hahniana mapped in their book by Hernández & Gómez-Hinostrosa (SPR 9) from herbarium specimens – which begs the question what IS or (maybe) WAS M. hahniana?!

Mammillaria hahniana disinterred [1]

Most plants provide convenient material to be flattened and preserved as herbarium specimens and proof of their source and taxonomic identity, but cacti are mostly reluctant to be preserved in this way (and collectors reluctant to sacrifice valuable living specimens!). Hence the dearth of such authentic cactus material in herbaria. So It is relatively rare for questions concerning the application of cactus names to be soluble by reference to a preserved specimen or specimens, especially the original one on which the name of a species was based, i.e. the nomenclatural 'type'.

Much of the herbarium of the Berlin Botanical Museum was destroyed by a fire caused by a bomb in 1943 during World War 2 but a few specimens of cacti preserved in spirit in glass jars survived (Leuenberger 1978/CSJGB 40(4):101–104). One of these contains material of *Mammillaria hahniana*, described in the first volume of the journal he founded and edited, *Monatsschrift der deutschen Kakteen Gesellschaft* 1(4): 77–79), by Erich Werdermann (1892–1959), at that time both Kustos (curator) of the botanic garden and President of the German Cactus Society.

With the description is an illustration that is one of the curiosities of the cactus literature, "a remarkably well-combed (and shampooed?) specimen" (Hunt 1984/ Brdl. 2: 87). Werdermann himself said it looked more like a *Cephalocereus senilis* seedling than a *Mammillaria* (though the numerous small tubercles visible at the base confirm it was the latter). Coincidentally(?) the Belgian importer De Laet captioned a photo of what might be *M. hahniana* (see 'G', page 85) "Cephalocereus senilis" in his 1929 catalogue. The following year, however, in the very first issue of his monumental series of articles and coloured plates, *Blűhende Kakteen*, Werdermann published a good photograph of a clump or group of plants in flower, in which its unkempt hair (*ungekämmtes Haar* – long axillary bristle-spines) can be seen on the sides of the larger heads, but not covering the apices in the way that the previous illustration had suggested a *Cephalocereus senilis* seedling.



Mamillaria Hahniana. Werd. n. sp. ²/₃ natürl. Größe

Werdermann's original illustration in Monatsschrift der Deutschen Kakteen-Gesellschaft 1(4): 77 (1929)



The photo of *'Cephalocereus senilis'* in De Laet's 1929 Catalogue

Having made such a commercially promising discovery, the Schmoll nursery, from which Werdermann directly or indirectly received the species, did not disclose the type locality. Initially Werdermann could only say *Mexiko in einer Höhe von etwa 2000 m. ü. m.* (Mum's the word!) but he was able to be more precise for the Blühende Kakteen entry: *Mexico, Statte Queretaro, Sierra de Jalpan an Felshangen über 2000 m hoch ins Gebirge gehend*. I believe the species as I have hitherto understood it extends into that general area of Querétaro between Jalpan and Concá, though more widespread in SE Guanajuato.

In 1929 no one was obliged by international rules to designate a 'type' specimen when proposing a new name and Werdermann did not do so. Leuenberger (I.c. 104) thought the plant in the bottle might be what we would now call the type and listed it as "Schmoll s.n. V [vegetative only] (type ?). Hunt & Taylor 2006/CSI 21: 8 designated it as 'Lectotype' but this was subsequently amended to 'neotype' by Eggli & Leuenberger 2008 (Willdenowia 2008/38: 251) on the grounds that the specimen was not preserved until 1931, three years after the name was published.

As my images of the jar (page 84) show, it is difficult to discern what is actually inside. So when I visited the Berlin Museum on 16 August 2016 I asked to see it and was given permission to disinter the contents. Lo and behold, there were *three* specimens within and a small packet dated 25 July 1930, containing (I understand) remnants of a flower, fruit, and seeds (Blutenrest, Frucht, Samen). I did not open the packet, as it appeared fragile and the seeds would be best left undisturbed unless and until a request to obtain SEMs might be agreed.

The current International Code of Nomenclature (ICN Art. 8(1)) states that the type (holotype, lectotype, or neotype) of a species or infraspecific taxon is either a single specimen conserved in one herbarium or other collection or institution, or an illustration. Art. 8.2 adds that for the purpose of typification a specimen is a gather-

ing, or part of a gathering, of a single species or infraspecific taxon *made at one time* [my italics]. Thus the neotype designation by Eggli & Leuenberger was not validly published under Art. 37.2 of the Code because, as can be seen in my images, Werdermann dated the small packet 25 July 1930 and the main specimen June 1931.

To most readers, I'm sure, arguments over what is or isn't the 'type' of a wellknown name, and the plants to which the name correctly applies, are a legalistic yawn, but in this instance, because of argumentation over whether or not *M. hahniana* is or isn't a 'good' species and its circumscription, geographical range and synonymy, we surely need starting points on what it looks like and where it was originally found. In this instance the original author has not given us a clear or conventional answer. His original photograph and the rotted specimen from Hahn he preserved are somewhat problematic, and the seedlings also preserved do no more than suggest they could be of the group to which *M. hahniana* can be referred.

Additional evidence on which to base a taxonomic discussion of *M. hahniana* is the colour photograph published by the author in his *Blühende Kakteen* a year after the original description (see below). Craig's illustration, Fig. 91 in his Mammillaria Handbook, 111 (1945), which was reproduced from one by F.M. Knuth (co-author with Backeberg of the Kaktus-ABC) in the US Journal (CSJA 6: 101. 1935), could also be taken as confirmation of the appearance of a fairly normal, that is to say 'average' specimen.



Werdermann's illustration of M. hahniana, Blűhende Kakteen, t. 2 (Oct. 1930)











The Berlin 'Hahniana' jar and its contents photos by DH 16 August 2016

- A, the jar with its modern label
- B, barcode (added c. 2008?)
- C, the jar from above
- D, the two seedlings
- E, packet of flower remains, fruit and seeds F and G, the empty (rotted) husk (inverted)
- H, close-up of label
- I, two axillary hair-spines, c. 4.5 cm long

14 Houniana hand von Hermole Mink. Vinling + Haber F G

The resemblance of this inverted husk to the plant in De Laet's photo of '*Cephalocereus senilis*' is noteworthy. Could it have been that plant, perhaps?

M. Hakaiana hara Von Munsh Keniks 1978. Veinleig. D. Kahn . TI 31. Н Reg. Nº222844 Pulgada пох

Mammillaria hahniana disinterred [2]

My investigation of the 'type' material of *M. hahniana* at Berlin was stimulated by an e-mail I received from the Chairman of the Mammillaria Society, Chris Davies, earlier in 2016. The maps of the series Leucocephalae in the Mammillaria volume of 'Mapping the Cacti of Mexico' (Hernández & Gómez-Hinostrosa 2015) indicate numerous locality records for *M. hahniana* in the states of Guanajuato and Querétaro so Chris was 'attempting to understand' the proposition by Rogozinski & Plein MAfM 26(1): 2–25; 26(2): 55–80; 26(3): 107–127; 26(4): 192–205) that *M. hahniana* was a redescription of *M. klissingiana* Boed. 1927 and that the name *M. hahniana* should be dropped because the original form had not been rediscovered in the wild.

First it has to be made clear that, even if *M. hahniana was* a redescription of *M. klissingiana*, the name was validly published and material (albeit not eligible as 'holo-type') preserved by the author. It could not simply be buried even if the original form had never been rediscovered in the wild, but even that claim is questionable in the light of the study by Sánchez & Galindo, reported in MAfM 18(1): 24-41 (1994) who found variation in the length of the axillary bristle-spines from 0.5–>4 cm in a batch of seedlings raised from seeds collected at Concá, the type locality of *M. saetigera*, one of the taxa often trated as a synonym of *M. hahniana*.

That *M. hahniana* was a redescription of *M. klissingiana*, which is well-known from some 200+ km north in Tamaulipas, is less implausible. To justify the proposed merger, largely on the basis of the original descriptions, Rogozinski & Plein were persuaded by the smaller tubercles ($5 \times 2-3 \text{ mm}$) of both taxa compared with the taxa that have been treated as synonyms, notably *M. woodsii* ($7 \times 6-7 \text{ mm}$) and *M. bravoae* ($8 \times 4-7 \text{ mm}$). Without statistical data from many more specimens, however, I'm not sure that would be adequate reason to treat *M. hahniana* and *M. klissingiana* as conspecific, especially in view of their apparent geographical disjunction.

But is it possible that what Werdermann described as *M. hahniana,* thinking it was from Querétaro, was actually a specimen of *M. klissingiana*? Commercial nurseries like Ferdinand Schmoll's at Cadereyta, from whom Boedeker and Craig as well as Werdermann, De Laet and other European nurseries received plants and photos, probably did not record or remember precisely where their stock plants and seeds were collected and it is not surprising that very little information reached the importers. Bearing in mind the fact that all Craig's illustrations of the plants we are discussing were of plants supplied by Schmoll, including those *M. klissingiana* and *M. hahniana*, the chance of a mix-up somewhere before Werdermann received the plant from Schmoll, via Hahn, cannot be entirely discounted.

Be all that as it may, if Rogozinski & Plein's proposal to 'sink' the name *M. hahniana* is accepted, the real problem is how to treat the various later-named and intergrading forms, including *M. bravoae* and *M. woodsii*, that occur in the same catchment area (the drainage system of the Río Santa Maria). To replace *M. hahniana* Rogozinski & Plein* proposed the reinstatement of *M. saetigera* Boed+Tieg 1933. This is another name based on an untypified import, generally with quite conspicuous central spines, but no authentic reference material, only a photograph

*Not 'Rogozinski & Appenzeller' as mistakenly stated in NCL.



M. saetigera (Kakteenkunde 1934: 190)



M. woodsii (Craig's Handbook 1945 fig. 95

(published 1934, therefore not admissible as lectotype). To elucidate their conclusion, the authors warned us (l.c. 66) they would "have to spend a lot of ink" (and they did); but not a lot of ink is needed, if tubercle size is a valid criterion, to reject it, since *M. saetigera* was described with tubercles c. **12** x 5–6 mm. That, surely, is too long for any member of the Leuocephalae? In *M. mendeliana*, another spiny member of the series named by Werdermann, the tubercles were only 8–9 x 6–7 mm. In view of the described tubercle size (somewhat apparent from the photograph, the 'type' of *M. saetigera* could actually have been a member of series Rhodanthae. In *M. calacantha* Tiegel 1933, for instance, another taxon received by Craig from Schmoll, the tubercles were 8-12 x 6-8 mm but with pale yellow radial spines (type locality: Angostura de Charcos [Cerro Zamorano?], Qro/Gto). *M.calacantha* was, I think, a form of *M. rhodantha* but it leaves is a question-mark against the identity of the original *M. saetigera* with its 12 mm tubercles. With this further uncertainty it might be safer to call the plants discussed by Rogozinski & Plein '*M.saetigera* auctt. non Boed. & Tiegel.'

Anyway, having reinstated *M. saetigera*, Rogozinski & Plein concluded that the other named forms of the erstwhile *M. hahniana* should be renamed *M. saetigera* subsp. *woodsii* (Craig) Rogozinski & Plein I.c. Perhaps, instead, it would have been better simply to reinstate *M. woodsii* as a separate species?

R. & P.'s dot maps of the distribution of *M. saetigera* (I.c. 61 and 207) suggest ssp. *saetigera* occurs near Concá (type loc.) and further north at Arroyo Seco (Mex 69 SE of Río Verde, SLP) and again disjunctly between El Guamúchil and Xichú (Gto). with ssp. *woodsii* in between, near Atarjea and around La Florida, near the SLP-Gto boundary. No altitudinal or ecological data were provided and (inevitably) all their observations were made within reach of well-travelled roads.

The taxonomy of these Leucocephalae mammillarias needs much more serious fieldwork. As Hernández & Gómez-Hinostrosa (2015 I.c. 108) pointed out, "the morphological differences between *M. klissingiana* and *M. geminispina* [*sic*] are unclear, and it is likely that field studies would prove that they are a single variable species." Yes, *all* the red-flowered, white-spined Leucocephalae (including *M. hahniana* and *M. klissingiana*) might end up under the umbrella of much earlier-described (and also problematical) *M. geminispina*.

From my Mexican Notebooks

So far, in this series and under this heading, I have only referred to trips I made many years ago before taking the opportunities that arose, thanks to Kew and IOS, to visit other Latin-American countries (and Zimbabwe). I made several more visits to Mexico between 1971 and 1992, but then not again until 2002, when I briefly visited Sonora, Nuevo León and Tamaulipas, and 2011, when I revisited the Tehuacán area to get to know the columnar cacti better with Salvador Arias as my expert instructor (see Cact.Syst. Init. 27: 24–32. 2012).

Then, In July 2013, after a further week in southern Mexico with Salvador, with the focus on columnar cacti again and my other research family Commelinaceae, I had the chance of a few days' tour of part of the states of San Luis Potosí, Guanajuato and Querétaro I had not visited before with the botanist Ulises Guzmán. He wished to show me a discovery he had made that might be a new species but, serendipitously, the route we took also enabled me to see many plants and populations of *M. hahniana* sens. lat. This brief experience doesn't count as a 'field study' of the nature envisaged by Hernández & Gómez-Hinostrosa and was certainly insufficient for me to discern any coherent pattern in the variation seen. But it has given me scope to illustrate some of the variability that certainly exists without spending a lot of ink. In the notes which follow, I am leaving most of the plants unnamed but giving my camera image numbers and approximate GPS coordinates.

1 July 2013

Starting from Santa Maria del Río (a town in San Luis Potosí on the main Mex 57 highway south of the city, north of the boundary with Guanajuato) we drove south a few km south to take the paved road east to Tierra Nueva and thence unpaved towards the Sierra Camarón, a southern extension of the Sierra de Alvarez. on this day we made several stops but saw no Leucocephalae, only a few 'green' mammillarias until the final one where Ulises showed me his discovery (as yet undescribed) and nearby what looked like *M. bocasana* (page 90).

2 July

From Tierra Nueva again, we drove along a new but still unsurfaced road being built to connect Santa Maria del Rio with the town of Río Verde and a new dam, reservoir and aqueduct for the city of SLP at El Realito, on the Guanajuato-SLP border. Our progress was somewhat hampered by a convoy of *camiones* carrying enormous pipes to be laid as part of the project. At c.1900 m (GPS 21.38/100.23) we began to see plants allied, I assume, to *M. hahniana*, but mostly dark-spined [6812] and then many more at c.1700 m (GPS 21.37/100.18) as we descended towards the site of the dam [6838-6858].

Apart from what to call them (still an open question!) the larger plants set me pondering such elementary questions as 'do axillary wool and bristle-spines only develop when the plants are capable of producing flowers and fruits?'; 'are flowers produced in the same axils more than once?'; 'what determines the length of the bristles', and so on. (Answers please! to dh@newcactuslexicon.org)

M. uncinata. San Luis Potosí, NE of Tierra Nueva, 1730 m, GPS 21.44N/100.22W. An example of a form frequent in this part of its range, contradicting its name by not having hooked central spines (though some may be curved or slightly hooked.





This plant and the rather dissimilar one below were seen growing quite close together further east and at somewhat higher elevation (21.43N/100.19W)

The whitish fruit of 6783 (*below*) helps to identify it as a short-spined form of *M. gigantea* but what about this one [6781]?





Ulises' unidentified *Mammillaria* (Lasiacanthae, formerly Bombycinae) [6792, 6794, 6796] growing in a rocky cleft with what appeared to be *M. bocasana* (Stylothelae). without hooked central spines [Locality withheld]







Huitzilopochtlia



The reservoir and dam at El Realito (21.36N/100.15W) are at about 1100 m in a zone dominated by *Stenocereus dumortieri*. Then, driving via Alamos de Martínez and Placuela to Río Verde, we stopped at a site where cacti had been transplanted from the area to be flooded. There were clumps of *Mammillarias* (and *Mammilloydia candida*) in good condition but one could only guess whether they were natives or refugees – not an entirely satisfactory consequence of the rescue operation.



Huitzilopochtlia

3 July

From Rio Verde, where we had stayed the night, Ulises took us first to a locality NW of the city to place he knew where there was a form of *M. crinita* (*M. brevicrinita* Repp.) Later, further south and lower (850 m) we saw earthbound *M. schiedeana* ssp. *dumetorum* in a forest of *Neobuxbaumia polylopha* and then, in the state of Querétaro, nearer Concá, more 'hahnianas' including a nice group up a tree.



