

SULCOREBUTIA CANTARGALLOENSIS GERTEL, JUCKER & DE VRIES AND S. LUTEIFLORA DE VRIES – TWO DIFFERENT SPECIES?

Willi Gertel and Hansjörg Jucker review two recently described species of *sulcorebutia* and with the aid of extensive fieldwork, conclude that they are actually just one species.

Since the discovery of *sulcorebutias* in the valley of Torre Pampa, which runs in an east-west direction from San Pedro all the way up to heights of the Cordillera Mandinga, there is a discussion of whether the plants found there are something independent or if they are closely related to *Sulcorebutia cantargalloensis*. San Pedro is situated about 35km north of Tarvita beside the main road from Azurduy to Sopachuy and Tomina. De Vries (2014) created precedents by describing *Sulcorebutia luteiflora* as a new species. The type locations of the two taxa are exactly 15km apart, *S. cantargalloensis* in the Cordillera Mandinga at 3600m and *S. luteiflora* in the aforementioned valley at about 2600m. Before we start the discussion, we would like to introduce in detail the two protagonists.

Sulcorebutia cantargalloensis

When the Swiss adventurer Hansjörg Jucker in 1993 for the first time crossed the Cordillera Mandinga, a massive range of mountains south-west of Zudañez, he discovered at the foot of one of the highest elevations of the cordillera called Cerro Cantar Gallo, *Sulcorebutia* (HJ407). Cerro Cantar Gallo (4130m) is a more southerly situated summit of the even higher Cerro Photulo Punta (4284m). The newly discovered *sulcorebutias* were reported to flower exclusively yellow. Also when Elizabeth and Johan de Vries came back from this mountain ridge they told us of black-spined *sulcorebutias* with yellow flowers. This error was revealed when Willi Gertel with his wife Renate in 2001 visited the Cerro



Fig.1. The distribution area of *S. cantargalloensis* and *S. luteiflora* – Distance type locality – Torre Pampa about 17km.

Photo: W. Gertel

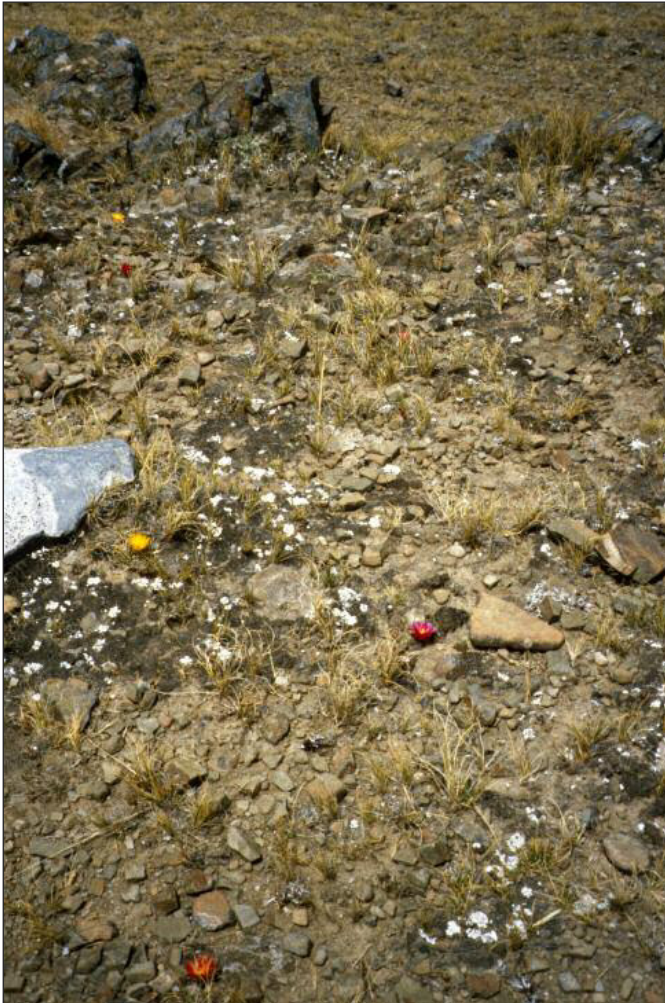


Fig.2. At the location of *S. cantargalloensis* G269 with different flower colours.

Photo: W. Gertel



Fig.3. *S. cantargalloensis* G269 with yellow flowers.

Cantargallo and found the whole population in flower.

Besides countless plants with yellow flowers they saw sulcorebutias with light violet and also different red flowering ones. Some years later (Gertel, Jucker & de Vries 2006) the new discovery was described as *Sulcorebutia cantargalloensis*.

During the following years, a veritable

Photo: W. Gertel



Fig.4. *S. cantargalloensis* G269 – a violet flowering form.

Photo: W. Gertel



Fig.5. *S. cantargalloensis* G269 – a plant with a brick-red flower.

Photo: W. Gertel



Fig.6. *S. cantargalloensis* G326 – very dark plant with completely black spines.

stampede to the Cord. Mandinga started, with the consequence that in the close surroundings of Cerro Cantar Gallo different locations of this new species were found. Besides the different colours of the flowers, all plants were quite uniform, rarely offsetting bodies, having a dark green to almost black epidermis and dark, mostly black spines, more or less bend to the body. There are very few exceptions to this short description.

Photo: W. Gertel

Fig.7. *S. tarabucoensis* fa. VZ253/7 with yellow flowers.

Photo: W. Gertel

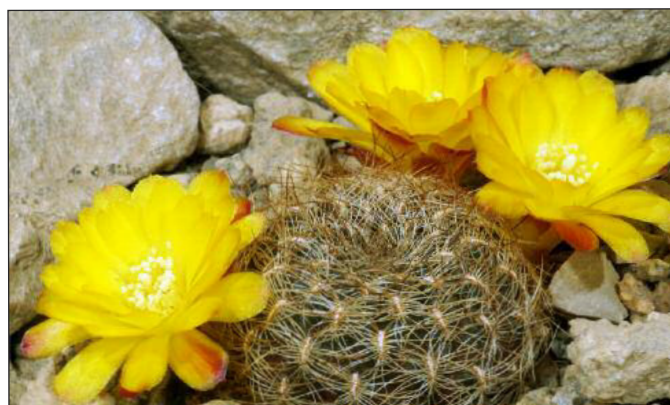
Fig.9. *S. luteiflora* RMR0921/1 from above the petrol station of Torre Pampa.

As far as we know today the population found directly on the south-eastern slope of Cerro Cantar Gallo is the one with the most colourful flowers, while those found more to the north almost exclusively display yellow flowers. Remarkably, no really bicoloured flowers are to be seen although the distribution area of *S. cantargalloensis* overlaps with that of forms of *S. tarabucoensis* Rausch, most of which flower red with a yellow throat. Interesting in this connection is a population discovered by de Vries (VZ253) only a few kilometres north of Cerro Cantar Gallo. They have a spectrum of flower colours just like *S. cantargalloensis*, but their habit is rather that of a form of *S. tarabucoensis*. At almost the same place (according to GPS-data) Rainer Wahl also found *S. cantargalloensis* (RW638). From all we know today *S. cantargalloensis* as described above and without any deviant forms can only be found in the immediate surroundings of Cerro Cantar Gallo.

Photo: W. Gertel

Fig.8. *S. tarabucoensis* fa. VZ253/9 with beautiful light violet flowers.

Photo: W. Gertel

Fig.10. *S. luteiflora* KB622/Ge1 found by Klaus Beckert only about 1km from the petrol station of Torre Pampa.

Sulcorebutia luteiflora

More or less by accident Johan de Vries and Roland Müller, during their trip 2009 near San Pedro, got to a side valley where a rather bad road beside a pipeline led them up to the heights of the Cordillera Mandinga. In very bad weather they found, at about 2600m, *sulcorebutias* (VZ632 and RMR0921) and later again at 3400m (VZ633 and RMR0922). Due to the weather conditions they were only able to take a few rather bad pictures. They showed some rather difficult to identify *sulcorebutias* with yellow flowers bearing red scales. Because of this some people immediately thought of *Sulcorebutia cantargalloensis*.

Two years later, the two travellers had better luck and thus were able to study these plants in tranquillity in better weather. They were surprised that some of the plants there had an incredible similarity with certain forms of *Sulcorebutia crispata* Rausch growing not far away. In contrast to those, they all flowered yellow which has never been seen in *S. crispata*. Besides this flower, it is rather difficult to define a typical *S. luteiflora* because almost

Photo: W. Gertel



Fig.11. *S. luteiflora* KB628 from a place high above Torre Pampa at 2900m.

Photo: W. Gertel



Fig.13. *S. cantargalloensis* VZ254/1 has been found in the middle of 'totally normal' *S. cantargalloensis*.

every plant looks somewhat different from another. According to the first description, *S. luteiflora* has bodies up to 5cm in diameter, rarely offsetting with a light green epidermis. The spines are coloured whitish-yellow to brownish-yellow. This description resembles quite well the RMR0921 shown above. But it could also be seen from the pictures within the article of the first description that these plants are very variable.

As always in cases like this, there was a rush to this valley and alongside the road comparable plants have been found in almost every altitude – all of them with yellow flowers.

This induced de Vries, as already mentioned in the first paragraph above, to describe these plants as *S. luteiflora*. Unfortunately, the article was drawn up in a great hurry and he completely ignored the new findings by Peter Lechner and Hansjörg Jucker, who in the meantime had explored the surroundings of this valley and wanted to communicate their information to the describer.

Photo: W. Gertel



Fig.12. A rather large plant of *S. luteiflora* KB628.

Photo: W. Gertel



Fig.14. Also a rather special *S. cantargalloensis* G327/3.

One point of criticism concerning this first description was the choice of the name because then, as well as today, it was known that *S. cantargalloensis*, definitely the closest relative, also has yellow flowers on the majority of the plants. It is certainly wrong when de Vries writes in the first description that the frequency of occurrence of the colours is violet, red and then yellow. Jucker estimates that more than 70% of the flowers of *S. cantargalloensis* are yellow. Also the statement that *S. cantargalloensis* in contrast to *S. luteiflora* would be strongly offsetting is highly questionable. No observations in the wild, nor on cultivated plants, support this. According to our knowledge there are only two clones of *S. cantargalloensis* in cultivation which are quite different from all the others (VZ254/1 and G327/3) having relatively light spines but only VZ254/1 is strongly offsetting.

Probably nobody would recognize one of these two plants, looking at them individually, as *S. cantargalloensis*, but they give us a hint for a close relationship with *S. luteiflora*.

Photo: H. Jucker

Fig.15. *Sulcorebutia* spec. HJ1307 at its habitat location.

Photo: H. Jucker

Fig.17. *Sulcorebutia* spec. HJ1307 with reddish brown spines in the crown.

***S. cantargalloensis* and *S. luteiflora* – one or two separate species?**

How can it happen that because of such obviously different *sulcorebutias* this difficult discussion has erupted? One reason is that *S. luteiflora*, in contrast to *S. cantargalloensis*, is very variable in habit. This is shown by the findings of de Vries and Müller as well as those of other collectors. Another reason is the large altitude distribution of *S. luteiflora*. Already down in the valley of Torre Pampa, one can see a strong variability which increases when going to higher localities. But also the research in the field by Lechner and mainly Hansjörg Jucker shows that the eastern slopes of the Cord. Mandinga are populated by an incredibly variable swarm of *sulcorebutias*. *S. cantargalloensis* and *S. luteiflora* are within this swarm only at the two extremes; the beginning and the end of a cline. Strictly speaking, out of this area only *S. cantargalloensis* is standing out as a well-defined and easy recognizable species, while for *S. luteiflora*, apart from the yellow flower, no uniform picture can be

Photo: H. Jucker

Fig.16. Adorable *Sulcorebutia* spec. HJ1307 completely trapped by stones.

Photo: W. Gertel

Fig.18. A beautiful plant grown from seed of *Sulcorebutia* spec. HJ1307 with a green body and purely white spines.

formed. The problem here might be that many observers only have in mind those magnificent, purely white-coloured forms, ignoring the multitude of other forms.

To illustrate this we would like to show the findings of three walks by Jucker in this area. During his first trip (2011) he hiked along the valley of Torre Pampa where he found for several kilometres to the south-west of the road probably the most beautiful population of these plants (HJ1307), which very well corresponds with the above mentioned ideal.

The plants sometimes have greenish, but mostly dark bodies and they are covered by white, tangled, hair-like spines. Sometimes there are some reddish-brown spines at the top of the plants. After some time these colours becomes pale and later on disappear so that most plants of this population appear more or less white. As we already mentioned above, some of the plants from the Torre Pampa Valley show this fascinating similarity with certain *S. crispata*. This is especially true for

Photo: H. Jucker



Fig.19. *Sulcorebutia* spec. HJ1308 coming from higher altitudes of the valley of Torre Pampa.

Photo: H. Jucker



Fig.21. Found near "Huayllas" *S. cantargalloensis* HJ1324.

HJ1307, because from the habit they can hardly be distinguished from the holotype of *S. crispata* R288 – but the flowers are yellow!

On his way up the slopes of the valley Jucker found some other *sulcorebutias* with light green bodies and white, more or less adpressed spines (HJ1308).

Still some 300m higher he came across some tiny, light green plantlets with white spines. Both populations consist of many large, multi-headed groups flowering exclusively yellow. They hardly correlate with the first description of *S. luteiflora* although one can see the type location of *S. luteiflora* from the places of the two field-numbers when the weather is good. It is only a distance of 4–5km as the crow flies.

During his next walk (2012), Jucker explored the area to the north and to the northeast of Cerro Cantar Gallo, as well as the eastern slopes of the Cord. Mandinga until he came to Torre Pampa. Because of the very many locations where he found *sulcorebutias* and the vast amount of pictures, we really have

Photo: H. Jucker



Fig.20. *Sulcorebutia* spec. HJ1308a from the highest areas of the Torre Pampa Valley.

Photo: H. Jucker



Fig.22. Above "Huayllas" – *S. cantargalloensis* HJ1324b with a rare violet flower.

problems to pick a representative selection.

Hansjörg Jucker started his hike near the small "village" of Huayllas, about 4km as the crow flies north of Cerro Cantar Gallo. We deliberately put village in quotes because there is no settlement as far as one can see, but there is an Estancia Huayllas to be located on the map. Probably 40 years ago when the military maps were printed there might have been a small town which has now disappeared.

As one could expect he found above this place *S. cantargalloensis*, most of them with yellow flowers and a few with magenta ones. As we already mentioned above, also near Huayllas, forms of *S. tarabucoensis* (VZ253 and others) have been found (see above).

Therefore, it is not surprising that the walker also found plants which can hardly be identified as *S. cantargalloensis*. These deviations became more numerous the further he walked to the east, and if they did not grow in between many *S. cantargalloensis*, one would be completely perplexed.

Photo: H. Jucker



Fig.23. *S. cantargalloensis* HJ1325b a typical plant from east of "Huayllas".

Photo: H. Jucker



Fig.25. *S. cantargalloensis* HJ1325c from east of "Huayllas".

Photo: H. Jucker



Fig.27. *Sulcorebutia* spec. HJ1326 only a few kilometres further on – *S. luteiflora*?

All flowers seemed to be yellow. Going further to the east the plants became even more atypical for *S. cantargalloensis*.

About 5-6km southeast of Huayllas and only slightly lower one hardly finds any similarities with *S. cantargalloensis*. The light green *Sulcorebutias* (HJ1326) are openly white spined and they strikingly resemble the plants from the Torre Pampa Valley. Only yellow flowers could be seen. An almost identical

Photo: H. Jucker



Fig.24. Also a HJ1325b, but no one would identify it as *S. cantargalloensis*.

Photo: H. Jucker



Fig.26. *Sulcorebutia* spec. HJ1325c from the same location as the plant in Fig.25, but clearly different.

Photo: H. Jucker



Fig.28. *Sulcorebutia* spec. HJ1326 with a green body and yellow flowers.

plant has been shown in Picture No. 3 of the first description of *S. luteiflora*.

Jucker's next discoveries (HJ1327 and HJ1327a) are quite different from the former populations. Besides plants which we would call *S. luteiflora* or others which are close to young plants of *S. cantargalloensis*, there were rather big, light green *sulcorebutias* with violet flowers which show us that Jucker was now close to the distribution area of *S. crispata*.

Photo: H. Jucker



Fig.29. Different forms of *Sulcorebutia* spec.HJ1327 – small, not offsetting plants – *S. cantargalloensis*?

Photo: H. Jucker



Fig.31. *Sulcorebutia* spec. HJ1327a with yellow flowers.

Photo: H. Jucker



Fig.33. *Sulcorebutia* spec. HJ1330 alongside the path north of Torre Pampa.

It seems that he found there, besides different forms of *S. cantargalloensis*, also plants that might be near *S. crispata*. We skip the next two finds (HJ1328 & HJ1329) because those indeed can be called *S. crispata* without reasonable doubt. He found them on the most easterly slopes of the Cord. Mandinga at lower altitudes of about 2200m, which is typical for the latter species.

Photo: H. Jucker



Fig.30. *S. luteiflora* or maybe *S. cantargalloensis*?

Photo: H. Jucker



Fig.32. Also HJ1327a – but this one will probably flower magenta.

Photo: H. Jucker



Fig.34. Just about north of the petrol station at Torre Pampa HJ1331.

Afterwards, his further path led him more to the west and to the south where he found, somewhat higher again, yellow flowering sulcorebutias (HJ1330 & HJ1331).

These plants are a little bit similar to HJ1326 and of course to those described by de Vries as *S. luteiflora*. When he came across HJ1332 and HJ1333 the Swiss walker was already directly north of Torre Pampa.

Photo: H. Jucker



Fig.35. *S. luteiflora* HJ1332a from Torre Pampa – a dark form.

HJ1334 finally comes from the southern side of the Torre Pampa Valley even a little bit higher than the finding-place of HJ1308. This appears to be the southern border of the complex *S. cantargalloensis/luteiflora*. These plants grow at an altitude of more than 3000m about 11km southeast of Torre Pampa.

Already after this trip it was clear to us that there is no sense at all in maintaining two taxa at specific rank in that area. In contrast to other statements (Lechner, 2015), the distribution area of *S. luteiflora* extends far beyond the valley of Torre Pampa and it overlaps in the



Fig.36. *S. luteiflora* HJ1333 from Torre Pampa – with a green body.

north with that of *S. cantargalloensis*. There are countless intermediate forms between the two “species” all over the region.

In spite of this, Hansjörg Jucker undertook another hike starting from Huayllas again to explore this area even better. This time he did not walk directly to the east but followed a path to the north. Also there he found *sulcorebutias* similar to those of his last trip near Huayllas. Again, some plants could be classified as *S. cantargalloensis*, others as *S. luteiflora*.

Photo: H. Jucker

Photo: H. Jucker



Fig.37. At the location of *S. luteiflora* HJ1333 looking down to Estancia Torre Pampa.

Photo: H. Jucker



Fig.38. *S. luteiflora* HJ1334 at almost 3100m, 11km southwest of Torre Pampa.

Photo: H. Jucker



Fig.40. *S. cantargalloensis* HJ1362.

Photo: H. Jucker



Fig.42. *Sulcorebutia* spec. HJ1368 – far to the northeast of “Huayllas” – aff. *S. cantargalloensis*.

Further to the east and at lower altitudes the swarm of forms again became unmanageable. To try to classify these plants would be a wild guess, especially because there were no buds nor flowers, nothing.

Later, he again turned to the south and also in a more easterly direction. He followed a mountain ridge about 6–7km south of his route of two year ago. Also here it is not possible to classify the plants he found, mainly because of

Photo: H. Jucker



Fig.39. Hansjörg Jucker's campsite near “Huayllas”.

Photo: H. Jucker



Fig.41. *Sulcorebutia* spec. HJ1364, 4km east of “Huayllas” – *S. luteiflora*?

Photo: H. Jucker



Fig.43. *Sulcorebutia* spec. HJ1368a – completely different

the lack of flowers or remains of flowers. Looking at them, one may speculate that the more westerly ones from higher altitudes might flower yellow and therefore belong to the *S. cantargalloensis* complex while the other ones from lower areas could be *S. crispata* (aff. *S. viridis*) if they really have violet flowers.

What is our conclusion now? The distribution area of the complex of *S. cantargalloensis/luteiflora* extends over an area



Fig.44. On the way over the slopes of the Cord. Mandinga at 2900m – *S. aff. cantargalloensis* HJ1369.

between 10 to 15km north-east and south-east as the crow flies from the type location of *S. cantargalloensis*. Throughout the entire area grow *sulcorebutias* in a boundless variability. *S. cantargalloensis* represents one end of this swarm growing at the highest altitudes while *S. luteiflora* is at the other end growing at more moderate altitudes. In contrast to the easily recognizable *S. cantargalloensis*, it is difficult to find an appropriate counterpart for *S. luteiflora*. (It is completely clear that we must orient ourselves on the type plant).

Starting from the originally known plants from Torre Pampa Valley we find all over this area the above mentioned multitude of different forms. Depending on how we look at them we will want to allocate a certain plant to either species. Apart from the clearly limited population from the slopes of Cerro Cantar Gallo, there is no way to find any border either geographical or morphological. For this reason, we consider both taxa as belonging to one species and therefore we put *S. luteiflora* as a variety to *S. cantargalloensis*.

Of course, the name "luteiflora = yellow flowering" does not make much sense as a variety of a mostly yellow flowering species. Therefore we chose a name for our combination which fits this new variety very well since it was first found in the valley of Torre Pampa.



Fig.45. 2.5km further on and still near 2900m – HJ1370a – a slight suggestion of *S. viridis*.

Sulcorebutia cantargalloensis* Gertel, Jucker & de Vries var. *torrepampensis* Gertel & Jucker. **comb. et nom. nov.*

Basionym: *Sulcorebutia luteiflora* de Vries. *Succulenta* **93**(1): 14 (2014). Type: de Vries 732.

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